Why do Publicly Listed Firms Go Private in Europe?

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Dissertation written under the supervision of professor Christophe Thibierge

Dissertation submitted in partial fulfilment of requirements for the MSc in Finance, at Universidade Católica Portuguesa and for the MSc in Management, at ESCP Europe Paris, June 2020.

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Abstract:

The literature on the going private (GP) decision in Europe often studies the determinants of public to private transactions in one specific or a small number of countries. Studies elaborate on different firm-specific factors, although frequently neglecting the importance of the macro environment. Additionally, the logit analysis is the primary statistical tool of analysis exploited.

This study examines the determinants of the GP decision in Europe by performing univariate, logit and survival analyses. The Cox Proportional-Hazard Model is used to consider the impact of time-varying firm-specific and macro environment characteristics, as well as the duration of public life, on the likelihood of a firm going private.

A sample of 1,735 firms from 39 different European countries, which went private between 1985 and 2020, is contrasted to 5,684 companies that remain publicly listed in Europe.

Results suggest GP firms to be smaller and undervalued, have lower stock liquidity, larger leverage and to have experienced lower abnormal returns than companies that remain public. Evidence highlights European markets to be more fit for large companies and that GP firms may need a capital restructuring. Furthermore, it also indicates benefits of liquidity and having a price which captures the value of the company to be decisive for publicly listed firms. Moreover, strong evidence is found of the importance of the macro environment, such as the existence of alternative sources of financing. Finally, country-specific characteristics affect the determinants of the decision to go private in Europe.

Keywords: Going private; Survival analysis; Mergers; Acquisitions

JEL Classification: G32, G34

Porque é que as Empresas Saem da Bolsa na Europa?

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Resumo:

Na literatura, são habitualmente estudados os determinantes da decisão de saída da bolsa na Europa num único país ou num pequeno grupo de países. Esses estudos analisam os diferentes fatores específicos das empresas, negligenciando frequentemente a influência do ambiente macroeconómico. A principal ferramenta estatística utilizada é análise logística.
Neste estudo são examinados os determinantes da decisão de uma empresa cotada sair da bolsa na Europa, utilizando a análise univariada, logística e de sobrevivência. O modelo Cox Proportional-Hazard é usado para estudar o impacto da variação ao longo do tempo das características específicas das empresas e do ambiente macroeconómico, bem como da duração de permanência na bolsa, na possibilidade de uma empresa se tornar privada.
Uma amostra de 1735 empresas de 39 países europeus, que saíram da bolsa entre 1985 e 2020, é comparada a 5684 empresas que permanecem cotadas nas bolsas europeias.
Os resultados sugerem que as empresas que saíram da bolsa são mais pequenas e subavaliadas, a liquidez das suas ações é menor, têm mais alavancagem e apresentam retornos anormais baixos. A análise evidencia que os mercados de capitais europeus são mais adequados para grandes empresas e que aquelas que saíram da bolsa podem precisar de uma reestruturação de capital. A liquidez das ações e a existência de um preço que reflita o valor da empresa são benefícios importantes na decisão de permanência na bolsa.
Adicionalmente, os fatores macroeconómicos, bem como as características específicas dos países, impactam significativamente a decisão de saída.

Palavras-chave: Saída da bolsa; Análise de sobrevivência; Fusões; Aquisições

Classificação JEL: G32, G34

Acknowledgements

I would like to express my sincerest gratitude to professor José Faias for his involvement, guidance and valuable insights. I am very grateful for his willingness to advise me on this dissertation.

I am grateful to my advisor, professor Christophe Thibierge, for his encouragement to pursue this topic.

To my parents, Madalena and Pedro, my most tender thank you for all the encouragement, confidence and love.

Finally, to my friends José Rodrigues, Luís Frade, Inês Paes Jorge, Barbara Silva and Madalena Coutinho, I thank them for their friendship and support during my academic life.

Lisbon, June 2020

Sofia Lapa

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III. List of Abbreviations

C_A – Ratio of Cash-to-Assets

CAAR – Cumulative Average Abnormal Return

CAPEX_S – Capital Expenditures-to-Sales

EC – European Commission

ESI – Economic Sentiment Indicator

EU – European Union

FCF_A – Ratio of Free Cash Flow-to-Assets

GP – Going Private

IBO – Institutional Buyout

IFRS – International Financial Reporting Standards

IPO – Initial Public Offering

KZ_I – Kaplan-Zingales Index

LBO – Leveraged Buyout

M&A – Mergers and Acquisitions

MB – Market-to-Book Ratio

MBO – Management Buyout

MV – Market Value

NFA_A – Ratio of Net Fixed Assets-to-Assets

OLS – Ordinary Least Squares

PE – Private Equity

R&D_S – Ratio of Research and Development Expenditures-to-Sales

SDC - Securities Data Company

SEC – Stock Exchange Commission

SEO – Seasoned Equity Offering

SME – Small-to-Medium Enterprises

SOX – Sarbanes-Oxley Act

UK – United Kingdom

US – United States of America

VC – Venture Capital

1. Introduction

Modern companies have their origin on the creation of East India companies in the 1600s. These companies were created as joint-stock companies, corporations owned by different investors whose stake on the firm depend on the number of stocks purchased. These early limited liability corporations allowed ship owners to decrease their risk exposure to unsuccessful endeavors to Oriental countries by raising investors to finance the voyages in exchange for a share of commercial profits, under the form of dividends. Shares were issued in paper and traded among investors in London coffee houses.

The creation of joint-stock companies highlights two main benefits for firms of having a diversified pool of investors: access to funding and risk dispersion. Nevertheless, many other benefits exist, mainly stock liquidity, the availability of a public stock price that incorporates all available information on a company or the creation of a stock currency to engage in M&A transactions. Additionally, it allows early investors to cash out and contributes to increased transparency and publicity, among others.

Indeed, the advantages for a company to be publicly listed are extensive and the associated costs of a listing procedure substantial, such as legal, advisory and accounting costs, fees and regulatory compliances. This raises the question of what could potentially cause a company to go back on its decision and go private?

In reality, being a public company is not all benefits. Publicly listed companies are subject to extensive regulatory and disclosure requirements and periodic compliance costs. They are arguably more vulnerable to takeovers and may suffer from incentive misalignment between the management and investors or between large and small shareholders. These costs are likely to impact differently each company, which raises a second question, deeply connected to the first one. Are firms which go private different from the ones that remain public?

Moreover, specialists highlight that, currently, the availability of private funds and the narrowing, or possible inversion, of the valuation premiums that, traditionally, public companies enjoy over private companies, are expected to boost the GP markets (Anthony, 2020). Additionally, the current low interest rate environment in Europe, which facilitates financing at low cost, and the large amount of funds Private Equities (PEs) dispose of is expected to lift the GP market in Europe (Hodgson, 2019).

Public to private transactions have been subject to a considerable number of studies, especially in the US. Despite literature displaying a substantial repetition on the motivations considered,

they vary in the number of drivers studied, the analyses performed, time frames and geographical regions. While some researchers study a factor, they theorize to be significantly important for companies in a specific country (e.g. Belkhir et al., 2013), others take into account a broader set of possible motivations (Renneboog et al., 2007). Nevertheless, the factors considered are systematically firm-specific and little studies consider macro variables as important delisting drivers. Furthermore, previous studies in Europe often focus on only one country or a small number of countries and frequently exclude Scandinavia and South and East Europe. Additionally, relatively short time frames are also considered, decreasing the number of observations and potentially affecting the applicability of results to a larger sample.

Bharath & Dittmar (2010) are one of the most exhaustive studies in this field, analyzing the impact of a broad set of firm-specific and macro environment variables on the motivations behind a GP decision in the United States (US). In addition to a univariate and logit analysis, these researchers perform survival analysis, commonly used in clinical trials, to study the determinants of GP transactions.

Following Bharath & Dittmar (2010)'s methodology, this study presents the results of a univariate, logit and survival analysis, using the Cox Proportional Hazard Model, on the relation between both firm-specific and macro environment characteristics and the decision to go private in Europe. The GP sample comprises 1,735 firms which went private between 1985 and 2020 in 39 European countries, including all North, Center, South and East regions. These companies are compared to 5,684 companies that remain, to the data collection date, publicly listed in all European countries considered in this study and for which there is data available on DataStream database. Data on GP deals was collected from the Securities Data Company (SDC) database and companies' financial data was retrieved from DataStream.

In accordance with previous literature on both going public and GP decisions, a broad set of hypotheses is tested, namely considerations on firm size, information availability, access to capital, liquidity, the agency theory, corporate control, stock market performance, business cycle and agent confidence, PE investment and alternative sources of financing.

This study's sample indicates the average GP European firm to take 11 years to exit public markets, two years less than what is observed by Bharath & Dittmar (2010) in the US. The year in which more public to private transactions were held was 2003 (105 deals), closely followed by 2011 (100 deals), the year in which the sovereign debt crisis hit Europe. These numbers represent small peaks in a pattern of public to private transactions volumes that seems to be

relatively well described by short and low-frequency cycles. Moreover, the countries that register higher public stock market exits are the United Kingdom (UK), accounting for 34.4% of the GP sample, France (14.2%), Germany (7.4%) and Sweden (7%).

This empirical study starts with a univariate analysis that compares mean and median values of firm characteristics, such as sales, stock turnover, free cash flow or leverage, of the GP and control samples at Initial Public Offering (IPO) year. Furthermore, it also compares GP firm-characteristics at the listing year and at the year prior to the stock delisting. Subsequently, a logit analysis is used to determine whether GP firm-characteristics at IPO can determine the GP decision. Finally, the Cox Hazard Model, which allows to analyze the effect of time on firm-specific and macro environment characteristics, as well as the duration of public life, is used to test the hypotheses. This model establishes a relation between the different considered characteristics and the likelihood of a firm going private. The study is complemented with a subsample analysis, by constructing four country groups of similar characteristics, to examine whether the country-specific environment impacts results.

This study emphasizes European markets to be less suited for small companies, what could eventually be explained by the high costs associated with being a publicly listed firm, as a large share of those costs is independent of firm size. Furthermore, it could also be explained by a lack of stock liquidity of small firms as investors might be reluctant to invest in these shares or are unaware of its existence. Furthermore, although GP firms exhibit lower amounts of leverage at the listing year, the likelihood of a firm going private increases with the amount of leverage a company acquires over its public life. In turn, this suggests GP firms to have difficulties in raising capital through equity markets, something which could be linked to illiquidity or lack of investment recognition or confidence. The macro environment is also found to be decisive. Additionally, differences in countries' corporate cultural, legal environment or financial markets attributes are likely to influence the determinants of GP transactions in Europe.

Bharath & Dittmar (2010) found similar results on leverage, liquidity and macro variables importance in the US. Nevertheless, while researchers did not find evidence of size being an important determinant, contrarily to this study, their paper supports the importance of access to capital for financially constrained companies, the significance of control considerations and agency problems to be relevant in an early sample period.

These findings could potentially benefit European financial markets regulators in efforts to improve the quality of European stock markets. Regulators should focus on financial markets

fit for small-to-medium enterprises (SMEs) and liquidity concerns, keeping in mind the country's corporate and stock market setting. Moreover, company managers should carefully evaluate whether benefits of being publicly listed considerably outweigh the costs, as changes in firm characteristics or the macro environment can invert this balance and stock listings are expensive and most costs non-redeemable.

This study is organized into eight chapters. Chapter 2 presents the literature review of recent studies on the GP decision, mainly in Europe. Chapter 3 shortly reviews the regulatory requirements of public companies in the European Union. Chapter 4 describes the hypotheses considered in this study. Chapter 5 presents the methodology followed in the empirical study. Chapter 6 introduces the data collection and treatment, as well as the descriptive statistics on this study's sample. Chapter 7 presents the results and chapter 8 the conclusions and suggestions for further research. Finally, chapter 9 and 10 present the references and the appendices, respectively.

2. Literature Review

Studies such as Jensen (1986), Lehn & Poulsen (1989) or Jensen & Murphy (1990) found some of the earliest and most important results in this field of study of corporate finance. Nevertheless, although these papers' hypotheses and results were considered in this dissertation, especially for hypothesis creation, they will not be considered in this literature review. Instead, more recent research papers will be discussed in this section and more emphasis will be given to studies developed in the European markets.

Bharath & Dittmar (2010) study the motivations of the GP decision, using a sample of 1,023 firms, which exited US public markets between 1980 and 2004, and compare it to 6,464 firms that remained publicly listed. In their analysis, researchers consider the effect of firm-specific characteristics (information, access to capital, liquidity, corporate control and agency problems), as well as, of macro variables (investor sentiment, term premium, default risk premium, bank loans and IPO and PE markets) on how firms weigh the benefits and costs of remaining public. The authors recur to a broad set of statistical tools, such as parametric mean comparison tests, non-parametric median comparison tests, logit analysis and the Cox Proportional Hazard Model. Further, out-of-sample forecasts were also performed.

One could argue, Bharath & Dittmar (2010) key finding to be that, in addition to the path a firm takes during its public life, firm characteristics at IPO can with reasonable accuracy predict whether a firm ultimately goes private. While their Cox Hazard model, using panel data, can predict which firms go private with 83.3% accuracy, their logit model, using cross-sectional data at the time of the IPO, can accurately predict 81.7% of the times a GP transaction. Moreover, the authors found strong evidence of information availability and stock liquidity considerations. Agency problems proxied to free cash flow only affect the GP decision before the 1990s and, although weaker, the researchers also found support for the control and access to capital hypotheses. Additionally, all macro variables considered are also found to be statistically significant, except for IPO value. To conclude, control and access to capital variables are absorbed by macro variables, suggesting these factors to be related to macro conditions.

Belkhir et al. (2013) focus their analysis on the effects of agency problems and excess control on the likelihood of French firms' delisting. Since, according to the authors, firms in France are characterized by a high level of ownership concentration, companies are more prone to experience agency problems between large and small shareholders, rather than between

managers and investors. The researchers compare two equally sized samples of firms matched by a propensity-score. Their study sample or GP sample comprises 167 corporations that went private in France between 1997 and 2009, while their control sample includes 167 firms that remained public for that period. The authors find agency problems between large controlling shareholders and small investors to deteriorate the attractiveness of a firm to market investors, consequently decreasing liquidity and the benefits of firms remaining publicly listed. In turn, large controlling shareholders would then be more prone to delist the firm themselves or to accept a takeover proposal.

Furthermore, they also find GP firms to hold larger amounts of free cash flows and to be undervalued before the transaction. No evidence was found for the hypothesis that tax savings, low growth opportunities and takeover threats impact the likelihood of a delisting. These results were obtained using mean comparison tests and logit regressions and checked for robustness with a sensitivity analysis.

In the Italian corporate landscape, Bettinelli et al. (2011) also study the effects of agency problems on the GP decision, using a sample of 381 companies publicly listed between 2001 and 2008. According to the researchers, there is often no difference between management and ownership, in Italian companies. Thus, believing agency problems would most likely arise due to information asymmetries between majority and minority shareholders. Their two main hypotheses are that firms with concentrated ownership, in a necessity of realigning incentives, and small companies, experiencing a higher degree of information asymmetries relating the real value of the company, are more likely to go private. Using the General Linear Model, researchers find evidence for the concentrated ownership's influence. However, they do not find a relation between size and the GP decision. Moreover, the authors use a logit analysis to study whether speculation and firm characteristics (as measured by the book value per share) influence the probability of a delisting. Nevertheless, they do not find proof for their hypothesis, possibly due to the lack of data.

Renneboog et al. (2006) study the decision to go private of the firm in the UK in a slightly different manner than described previously. In place of logit models, the authors do a premium analysis and an event study around the delisting date, computing cumulative average abnormal returns (CAARs), to define the sources and magnitudes of shareholder gains in such transactions. The idea is thus to identify the underlying incentives of a delisting through an evaluation of shareholder gains, which assumes a strong relationship between abnormal returns

of shareholders and the motivations to go private. This analysis has limitations, as different factors may cause abnormal returns, yet being uncorrelated to the GP decision.

The study is performed using a sample of 177 firms which went private during what the authors identify as the second wave of GP transactions in the UK (1997-2003). This paper makes a more extensive analysis of the potential drivers of GP transactions, considering the effect of tax benefits, interest realignment, corporate control, free cash flow, transaction costs, takeover defenses and undervaluation.

On one hand, results support strongest the positive correlation between undervaluation pre-deal and shareholder gains, especially in management buyouts (MBO) and institutional buyouts (IBO), as, due to information asymmetries, incumbents are more prone to explore better undervaluation opportunities. Furthermore, results also sustain the incentive realignment hypothesis, which says that low levels of pre-deal managerial equity ownership in MBOs and IBOs lead to more shareholder gains, as there is scope to increase shareholder ownership and improve alignment of interests. Moreover, the hypothesis that costs associated with keeping a firm listed on a stock exchange are a driver of market exits is not found to be false. However, due to the difficulty in measuring such costs, the authors are reluctant to affirm its veracity. Additionally, findings also support control considerations, as lower gains are associated with a higher level of concentrated ownership of outside shareholders, due to low scope for improvement.

On the other hand, tax shield considerations are not found to be relevant, despite high premiums being associated with low levels of pre-transaction corporate debt. The hypothesis that firms are taken private to reduce free cash flows, decreasing agency problems, is also not sustained. Finally, managers are not found to pay more for firms under threat of an undesired takeover bid.

Finally, Sannajust, et al. (2015) study the GP decision internationally. This paper's sample includes 535 public market exists between 2000 and 2010 in the US, Europe (France, Germany, Italy, Netherlands, Spain, Sweden and the UK) and Asia. This GP sample is compared to a similar number of firms, controlled by size, location, business sector and stock quotation. This paper also considers a broad set of firm-specific variables: tax savings, incentive realignment, control considerations, free cash flow, growth prospects, takeover defenses and undervaluation. Authors find the non-country-specific typical GP firm to be undervalued before the transaction and to have low managerial share, significant cash flows, a weak growth outlook, low stock liquidity and dispersed capital (low level of institutional, corporation or family control). Note

that results of control are different from the ones found in France (Belkhir et al., 2013), Italy (Bettinelli et al. (2011) and UK (Renneboog et al., 2006). This finding might be explained by the important role of "family block-holder"[1] ownership identified in European countries by Sannajust, et al. (2015) Researchers find reasoning on the agency problems generated by the lack of monitoring associated with a dispersed shareholder base, which are minimized when the concentration of ownership escalates in a GP transaction.

Similarly to this study, Sannajust, et al. (2015) perform parametric (t-student) and non-parametric (Wilcoxon) tests and a logit analysis, using data variables at the year prior to stock delisting. In this way, the paper does not consider the effect of time-varying characteristics.

In Europe, results highlight high concentration of management and family ownership in GP firms, as well as a low level of stock liquidity, high cash flows, undervaluation and low growth prospects. According to Jensen (1986), firms with low growth expectations are more likely to exit public markets, as they are linked to poor management. Furthermore, no evidence for takeover defenses, taxation and gearing considerations was found.

In the UK results are similar to Continental Europe except for the statistical significance of "family block-holder". In fact, a larger "institutional block-holder" and a smaller "family block-holder" are observed in delisting companies in the UK than in Continental Europe. In the US, results were similar to the ones found in the UK. In Asia, authors only find takeover defenses and concentrated family ownership not to be statistically relevant in GP deals.

[1] Block-holder variables are dummy variables equal to 1 when the shareholder group in stake has at least 5% ownership in that firm and 0 otherwise.

3. Legal Environment

According to La Porta et al. (1997), the legal framework of each country has implications on the size and extent of a country's capital markets, suggesting that the laws in place and their enforcement may cause different countries' markets to vary in terms of market capitalization and number of IPOs. In this way, the legal environment of the countries in study may play an essential role on the results obtained and how they compare to findings in the US market on a firm's decision to go private. Moreover, while a good legal environment increases the confidence of financial market agents to invest in securities (La Porta et al., 1997), overburdening firms with administrative and legal work may counteract the benefits of being public. Engel et al. (2007) study the response of firms to the passage of the Sarbanes-Oxley (SOX) Act of 2002[2] in the US, and find evidence that, when the costs of complying with the additional regulations outweigh the benefits of additional transparency and enhanced corporate governance associated with the SOX Act, firms go private.

Publicly listed companies in Europe are subject to a number of rules and regulations. Companies considered in this study were publicly listed in 39 different countries in Europe, making it extensive and out of scope of this study to review all country-specific legal requirements for public companies. Nevertheless, the EU laws apply to 28 of those countries[3], which may be considered a representative sample.

Publicly listed companies in any stock exchange of an EU country are subject to financial reporting regulations and transparency requirements. These require public companies, independently of their size, to prepare half-yearly and yearly consolidated financial reports in accordance with the International Financial Reporting Standards (IFRS) and publish information regarding major changes on the holding voting rights and *ad hoc* inside information which could affect the securities' price. Furthermore, to raise capital through public offerings, companies must offer investors a prospectus, a legal document containing all information needed for market participants to make an informed investment decision. Additionally, firms of large public-interest and which employ more than 500 workers are subject to non-financial reporting policies. These require companies to include non-financial statements in their annual reports from 2018 onwards, which comprise detailed information on how enterprises operate and manage social and environmental challenges, such as social responsibility and treatment of

[2] Approved in 2002, in the US, the Sarbanes-Oxley (SOX) Act aims to improve the protection of investors from fraudulent acts undertaken by publicly listed companies.
[3] UK is included as the Brexit took place after the period in study.

human rights. Finally, firms operating in some industries, such as mining and forestry, must report on a country-by-country basis on the taxes, royalties and bonuses that they pay worldwide.[4]

Despite limited liability companies operating in the EU having to deliver annual financial statements to the relevant national business register, the additional requirements that listed companies in Europe are subject to may constitute a burden and be associated with high expenses. These effects are likely to strike harder SMEs, since costs and requirements are, in general, not proportional to firm size or profitability. Pagano et al. (1998) find fixed costs for publicly listed companies in Italy to be around $250,000 and variable costs to be 3.5% of gross proceeds.

In fact, despite the benefits of being a publicly listed company, European public markets are recording lower levels of new issuers, especially SMEs whose IPO levels are currently half compared to levels prior to the financial crisis of 2008. Two potential sources for this problem can be identified. First, compliance costs to list on public markets are high and, second, liquidity is insufficient, which can make investors unwilling to invest on SMEs' stocks and increase the cost of capital for issuers.[5]

Furthermore, previous papers which study a firm's decision to go public in Europe find the median age of Continental European firms at IPO to be significantly higher than Anglo-Saxon country-based firms. While Loughran & Ritter (2004) find the median age of US firms for 6,419 IPOs, from 1980 to 2000, to be 7 years, Schuster (2003), studying 973 IPOs, between 1988 and 1998, in six countries of Continental Europe and Sweden, find the median age of European firms at IPO to be 17 years. This suggest European financial markets to be more suited to mature companies.

To counteract this trend, the European Commission (EC) has put in place, since May 2018, more proportionate rules for SMEs. Nevertheless, given that this new legislation has only been in place for less than two years of the time period considered in this analysis, it is expected that size will negatively impact the probability of a firm to go private.

[4] Legal requirements were retrieved from the European Commission official website.
[5] Source: European Commission website

4. Study Hypothesis

According to exiting literature on both going public and GP decisions, this chapter presents the different hypothesis that will be considered in this study, as well as the variables that will be used to examine those hypotheses. Appendix 5 displays the variables description.

4.1. Firm-Specific Characteristics

4.1.1. Size

In the chapter 3, it was highlighted that smaller firms might find it harder to be publicly listed due to insufficient liquidity, linked to the lack of investor recognition, and high regulatory compliance costs of listed firms, which until a short time ago, in the European Union (EU), were independent of firm size. Moreover, the high median age of Continental European companies at IPO identified in a variety of papers, may indicate that Continental European markets are less suited for small companies. Hence, if SMEs are less likely to file for an IPO, it may also be the case that smaller firms are more likely to exit public markets. This paper will proxy size to the natural logarithm of market value (MV) or sales.

Size Hypothesis: Smaller firms are more likely to go private.

4.1.2. Information Atmosphere

Information asymmetries between insiders and investors are common in publicly held firms with low level of concentrated ownership and information costly to obtain. Several theories draw on the impact of the information atmosphere on the costs and benefits of a firm remaining public, taking into account different economic drivers.

Gheorghiu (2013) considers adverse selection as a source of market failure, as investors' concerns that they might be purchasing a "lemon" negatively impact the average quality of firms seeking to go public and the price at which they are subsequently sold. According to Leland & Pyle (1977), private firms suffer from information asymmetries at a smaller scale, as entrepreneurs can signal the quality of their projects by investing more of their wealth in the firm.

Chemmanur & Fulghieri (1999) find evidence of high costs associated with the duplication of information of publicly listed companies' investors, which are ultimately passed on to the firm. This concern can be mitigated by the availability of a public price that incorporates all available

information on the company, assuming market efficiency, thus, liquidity being an important factor.

Merton (1987) shows that expected returns decrease with the degree of investor recognition, i.e., the size of the investor base, due to the existence of market frictions in the short to medium term that counter the classical model of perfect market information.

Information asymmetries and frictions can be reduced for firms which have more visibility and more information available at lower cost, hence, these firms being less likely to go private. Furthermore, a concentrated ownership, as well as a higher degree of institutional ownership may also smooth information frictions as these, in general, have easier and ready access to more detailed and accurate information. In this way, the number of analysts following a firm, the level of institutional holdings and concentrated ownership constitute good proxies to study these hypotheses (Bharath & Dittmar, 2010). Nevertheless, due to the incompatibility of the required data sources to construct theses variables and the data sources used to construct the analyzed sample, or the lack of access to them, the previously stated hypotheses will not be studied. Notwithstanding, size is likely also to capture the spillovers of information asymmetry, which strengthens the size hypothesis, as Chemmanur & Fulghieri (1995) highlight adverse selection problems to be stronger in young and small companies, given their low visibility and track record.

Finally, Subrahmanyam & Titman (2002) find evidence that the benefits of public financing are high when information is cheap to obtain and abundant. The authors define serendipitous information as insights stock market investors come across in their daily activities and draw on the hypothesis that firms would prefer to go private as costs of gathering serendipitous information increase. This study will proxy the availability of serendipitous information to the ratio of Research and Development Expenditures (R&D) to sales, given that the previously mentioned researchers found serendipitous information to be scarcer in high-tech firms.

Serendipitous Information Hypothesis: Firms with higher availability of serendipitous information are less likely to go private.

4.1.3. Funding Considerations

One of the most well-known benefits of being publicly listed is the access to an alternative source of funding. Kim & Weisbach (2008) examine the motivations behind public equity offers from 38 different countries and find evidence of incremental R&D and capital expenditures,

which is consistent with the hypothesis of investment financing. This motivation is even more likely to be stronger in firms which have limited access to alternative financing due to high leverage or high transaction costs. Consequently, firms with less investment and growth opportunities would be more likely to go private and financially constrained firms would prefer to remain public to finance their activities. Contrarily, Pagano et al. (1994), which study Italian company's *ex ante* and *ex post* the IPO, find companies to go public to rebalance their balance sheet, after a period of large investments and growth. Similarly, Subrahmanyam & Titman (1999) argue that Germany and other continental European countries rely more on private and internal generated capital than US firms. To tap into these considerations, the capital expenditures (CAPEX)-to-sales ratio of firms will also be studied.

Following Bharath & Dittmar (2010), to measure financial constraints the Kaplan-Zingales (KZ) index and whether a firm distributed dividends or not in a given fiscal year (*Dividend Dummy*) will be used. Notwithstanding, Hadlock & Pierce (2010), among others, cast some doubt on the validity of the KZ index and find Seasoned Equity Offering (SEO) activity to predict financial constraints better and with a high significance level. When costs of accessing external capital are high, firms should delay SEO issues. In this way, the number of SEO issues and the corresponding amounts raised in a given fiscal year in Europe will be considered. Additionally, the annual number of bond issues on the likelihood of a firm going private will also be studied. These debt instruments are an appealing alternative source of financing to public equity markets and other types of debt financing, as bank loans. In opposition to debt financing, for companies, corporate bonds may entail some significant advantageous, such as lower borrowing costs and lengthier tenors. Furthermore, corporate bonds are a less permanent means of funding, are generally cheaper and entail fewer administrative and disclosure requirements than equity financing (Expert Group on European Corporate Bond Markets, 2017). In this way, corporate bonds will be studied as an alternative source of financing to equity markets.

Finally, firms may also want to go public with the goal of minimizing the cost of capital. According to Modigliani & Miller (1963), the lower the cost of capital for a firm with a public versus a private status, the higher the incentives for a firm to go public. Furthermore, public status also allows exposure to competition between financial suppliers and, consequently, access to private capital at lower rates (Röell, 1996). Pagano et al. (1994) find Italian companies to experience a decrease in the cost of bank credit *ex post* IPO.

Financially Constrained Hypothesis 1: Financially constrained firms are less likely to incur in a GP transaction.

Financially Constrained Hypothesis 2: Periods in which SEO market activity is low and bond issues are high is more likely to be associated with an increased likelihood of public to private transactions.

4.1.4. Liquidity Benefits

Many authors have highlighted the significance of liquidity considerations in a firm's decision to go public. Bolton & Von Thadden (1998) and Boot et al. (2008) highlight the importance of the trade-off between liquidity and control in firms' ownership structure decisions. Zingales & Rajan (1995) and Mello & Parsons (1998) believe that firms go public to establish a market value and, thus, provide liquidity. Consequently, theoretical arguments support the idea that liquidity is a benefit of being public. Moreover, public exchange transactions are frequently cheaper compared to bilateral trades (Bharath & Dittmar, 2010), a benefit which increases with the trading volume. Hence, this study builds on the hypothesis that as liquidity benefits of trading in public markets deteriorate, firms are more likely to go private. As a proxy for liquidity *ILLIQ*, as computed in Amihud (2002), and the stock's turnover will be used.

Liquidity Hypothesis: Firms with higher liquidity are more likely to exit public markets.

4.1.5. The Agency Problem

Jensen (1986) studies the alignment of interest between managers and shareholders in issues such as the optimal size of a firm and cash distributions to shareholders. The author argues that debt can have a positive effect on reducing the agency costs of free cash flow (FCF), especially for high FCF firms, suggesting that LBOs lead to efficiency gains. This is due to the fact that the higher debt burden and, in some cases, the increase of the managers' equity position leads to a higher alignment of understandings between managers and shareholders. In this way, firms may wish to go private to improve corporate governance and incentive alignment. Following Bharath & Dittmar (2010) and Lehn & Poulsen (1989), this hypothesis is studied empirically using the ratios of FCF-to-assets, firm leverage, cash to assets and net fixed assets (NFA)-to-assets. It is expected that firms with high ratios of FCF, cash and NFA-to-assets and low leverage are more likely to go private.

Agency Hypothesis: Firms with greater availability of cash are more likely to exit public markets.

4.1.6. Corporate Control

Going public has significant implications over the ownership structure of a company. On one hand, it can serve as a way for financial investors, such as venture capitalists and business angels, or founders to cash in their investment. On the other hand, it can benefit a firm looking for engaging in M&A operations. More precisely, Zingales (1995) claims an IPO to be a first step to sell a company at an attractive price through a takeover, while, Brau et al. (2003) and Brau & Fawcett (2006) consider that an IPO can be a way for a firm to create a currency, i.e. public shares, to engage in mergers and acquisitions (M&A) transactions. This suggests that a firm's activity for corporate control is correlated to the benefits of being publicly listed. Thus, if a firm has a low level of activity in corporate control deals, it is more likely to go private. The variables that will study this hypothesis are the number of M&A deals a company was involved in as an acquirer and the market-to-book ratio, as Zingales (1995) suggests the value of the cash flow rights to fluctuate more with market conditions than control rights. Note that, this subsection relates to the previous considerations drawn on access to capital as a firm might need financing to engage in such deals.

Moreover, Fidrmuc et al. (2013), among others, find the threat of takeover to be an important determinant on the management's decision to go private, as, often, after a takeover, the incumbent management is replaced. Nevertheless, this theory will not be tested due to the lack of data sources.

Control Hypothesis: The likelihood of a firm going private is negatively related to a firm's activity for corporate control.

4.1.7. Window of Opportunity

To conclude this extensive subsection on factors based on firm characteristics, the possible performance of a firm's stock price weight on GP transactions will also be studied. Consequently, the excess return of a company's stock price compared to market return will be taken as a variable. Despite, the existing literature not having a unified view on this factor, this dissertation will build on the premises that firms which experience high excess returns are more likely to go private. There are two main forces behind this premises. Firstly, as Ritter (1991) shows there are periods in which stocks are mispriced, firms may take the opportunity to make capital gains by exiting public markets. Secondly, firms seeking to engage in strategic

acquisitions or private funds cherry picking their portfolio companies may wish to buy top performers.

Window of Opportunity Hypothesis: Firms with lower abnormal returns have lower probability of going private.

4.2. Macro Environment

Macroeconomic conditions may also affect the benefits and costs of a firm remaining publicly listed, which can ultimately lead to a firm's decision to go private. The number of different market factors that can impact this decision is broad and hard to capture in a single model. This study will thus focus on a hand-full of variables that according to past literature can impact a firm's decision to go private. This subsection, as the previous one, is organized by economic factor.

4.2.1. Business Cycle and Confidence

This study draws on the premise that business cycles and investors' expectations of the macro environment can influence investors decision on whether to invest their savings in the public or private markets. In times of financial crisis or when there are expectations that markets will go down, investors will allocate more of their capital on private placements, which can directly constrain the liquidity of public markets and may also decrease the valuation premium that, historically, public firms frequently trade over private ones (Sarin et al., 2000 and Elnathan, et al., 2010). This hypothesis thus considers a substitution effect between public and private markets, which can decrease the liquidity and access to capital benefits of public listed firms previously mentioned. Accordingly, firms are more likely to go private in times of pessimist expectations of the economic environment.

As a sentiment indicator, this study will make use of the Economic Sentiment Indicator (ESI), which reveals the likely evolution of the business cycle activity in Europe and presumably captures the optimist and pessimist expectations of the market.

Confidence Hypothesis: Firms are more likely to go private when the sentiment is low.

4.2.2. Private Equity Market

Bharath & Dittmar (2010) show both private equity number of deals and value to statistically significantly increase the likelihood of a firm going private in the US. Moreover, Bernstein et al. (2019), comparing a sample of 722 PE-backed companies in the UK to a carefully selected control sample during the 2008 financial crisis, find that PE-backed firms experienced a smaller decline in investment than the control group, which can be explained by the use of the private equity sponsors' relationships to raise equity and debt funding and to decrease affiliates' cost of capital. These results are stronger in companies which were more likely to be financially constrained and in which the PE funds had more capital available to inject in the portfolio companies. Thus, Bernstein et al. (2019) find evidence of their hypothesis that PE sponsors lighten financial constraints of affiliated companies in a sudden tightening of credit markets.

Finally, on the last two decades, although subject to cycles, PE funds have significantly increased the amount of assets they have under management in Europe which may boost the number of GP transactions. Among others, the increase in PE fundraising amounts has two major potential consequences on a firm's decision to go private. Firstly, as a considerable amount of assets is allocated to the same type of companies, increasing their valuation, the previously mentioned premium gap between public and private companies may invert. Secondly, as good investment opportunities in private markets get scarcer, PEs can look for better investments in public markets, taking firms private.

In this way, by lightening firms' financial constraints or inverting the premium gap between public and private companies or, simply, because they have more funds available, PE funds' investment patterns potentially explain going-private transactions. To test this hypothesis, the amount invested in Europe by PE and venture capital (VC) funds will be used as a proxy.

Private Equity Hypothesis: Firms are more likely to go private in times when PE investments are high.

4.2.3. Bank Loans Market

Finally, following the previous analysis of a possible substitution effect between private and public capital, a similar phenomenon may also happen with the availability of business loans at low costs. As banks extend or lessen the amount of corporate loans to non-financial businesses, by simply changing their price (i.e., interest rates) or altering the requirements needed for a

corporate loan, the benefits of having access to public capital may change accordingly. It is expected that in periods in which interest rates are low or new loans to corporates are high, a higher number of firms will go private. Due to the lack of access to databases on all European countries' corporate loans amounts and interest rates, the variables considered are the average interest rate on loans to corporates and the amount of new business loans in the Euro Area.

Bank Loans Hypothesis: Firms are more likely to go private in times of low corporate loans interest rates and high new business loans.

5. Methodology

Following Bharath & Dittmar (2010), this study will make use of univariate, logit and survival analyses to study the motivations of the GP decision in the European markets.

In subsection 7.1., a univariate analysis is performed to examine the differences in inherent firm characteristics between the control and the study sample at IPO year, as well as firm characteristics of the GP sample at IPO and at the year prior to going private. In each of these two analyses both parametrical mean and non-parametrical median tests are executed.

Relating firm characteristics at IPO year and in the year prior to going private of the study sample, the Paired Data Mean-Comparison t-test and the Sign Test of Matched Pairs are used to compare mean and median values, respectively. These paired tests consider the data to be collected from the same subjects. The Mean-Comparison test studies the hypothesis that the difference between the mean values of different variables is equal to zero and the Sign Test takes the null hypothesis that the median of the differences between to variables is zero.

Comparing the study and control samples at IPO, the Two Sample Mean-Comparison t-test, using groups, and the Non-parametric Equality of Medians test, which deliberate on different samples, are performed. The Equality of Medians test studies the null hypothesis that the samples were retrieved from populations with the same median.

Furthermore, to analyze whether intrinsic firm characteristics at IPO can determine the GP decision, this study recurs to a logit model, in which the dependent variable is a dummy equal to one, if the firm went private, or equal to zero, otherwise. The following regression includes the most complete set of explanatory variables estimated in the logit analysis:

$$\begin{aligned} Logit_i = \beta_0 + \beta_1 \ln(MV)_i + \beta_2 R\&D\_S_i + \beta_3 ILLIQ_i + \beta_4 Turnover_i + \beta_5 CAPEX\_S_i \\ + \beta_6 Dividend\ Dummy_i + \beta_7 KZ\_I_i + \beta_8 Acquisitions_i + \beta_9 MB_i \\ + \beta_{10} Leverage_i + \beta_{11} FCF\_A_i + \beta_{12} Cash\_A_i + \beta_{13} NFA\_A_i + \varepsilon_i \end{aligned}$$

in which $Logit_i$ is the natural logarithm of the odds of a given firm *i* going private. The odds are given by the ratio between the probability of success (i.e., a given firm *i* will go private) and the probability of failure.

In contrast to Ordinary Least Squares (OLS) linear regressions, the logit model admits the dependent variable to be dichotomous by fitting a non-linear function to the data, it allows for different marginal effects at the distribution tales and avoids heteroskedasticity. Additionally,

while probit regressions also tackle the drawbacks of linear models for this study's desired analysis, by applying logit models, the coefficients can be interpreted in terms of odd ratios. For example, one unit increase in the market-to-book ratio increases (decreases) the odds of going private by the exponential of β_9, if the coefficient is positive (negative).

Nevertheless, one should keep in mind, when analyzing the logit regressions results, that this model involves some important assumptions. Those include low correlation among explanatory variables, a linear relationship between the log odds and the independent variables, the inexistence of outliers and the independence of observations. Furthermore, this model results are more likely to be less accurate if the number of observations is low. Consequently, and to study the effect of time-varying characteristics, a survival analysis, using the Cox Hazard Model, is also performed.

Survival analyses are commonly used in clinical trials to relate the survival time of a patient to some predictor variables, such as sex or age. While other survival analyses methods, such as the Kaplan-Meier survival curves or the Log-rank tests, only study the impact of one predictor variable at a time and work best with categorical variables, the Cox Hazard Model enables to consider a wide range of different risk factors, categoric or quantitative, simultaneously. Furthermore, this statistical method also admits the existence of censured data, i.e., patients or, in this study's case, firms for which the event being study - going private - never occurred.

In this way, in this study, the Cox Hazard Model analyzes the relationship between the duration of public life of firms (i.e., survival time) and firm-specific and macro environment characteristics (the predictor variables). The model is estimated as follows:

$$h[t, X(t)] = h_0(t) \times e^{(\beta' \times X(t))}$$

in which $h[t, X(t)]$ is the hazard rate of a firm at time t, $h_0(t)$ the baseline hazard, β' is the coefficients matrix and $X(t)$ the covariates matrix.

The hazard rate is the probability with which one firm goes private at time t and the baseline hazard is the hazard rate when all covariates take the value zero. Furthermore, e^{β} is the hazard ratio, which indicates how the hazard or the instantaneous risk of the GP event changes for a unit variation in a given explanatory variable. For example, if the coefficient of the risk factor *Leverage* takes the value 0.324, the hazard ratio is given by $e^{0.324} = 1.383$. This means that an increase of 1 unit in firm leverage leads to an increase in the hazard rate, or risk of going private, of $(1.383 - 1) \times 100 = 38.3\%$. If the coefficient is equal to zero, the hazard ratio is equal to one and the variable has no impact on the hazard rate. If the coefficient is positive (negative),

the hazard ratio is higher (lower) than one, meaning the risk factor causes an increase (reduction) in the hazard rate.

Finally, the Cox Hazard Model also considers some assumptions. Firstly, it assumes a proportional hazard, i.e., the hazard of a firm going private is a constant multiple of the hazard of another. Secondly, it deems linearity between the log hazard and the risk factors. Lastly, it considers no individual observations are influencing to a great extent the regression coefficients.

6. Data and Descriptive Statistics

6.1. Data Collection and Treatment

The Stock Exchange Commission (SEC) defines a going private transaction as:

"When a public company is eligible to deregister a class of its equity securities, either because those securities are no longer widely held or because they are delisted from an exchange" (US Securities and Exchange Commission, n.d.),

wherein eligibility means that equity securities are held by less than 300 shareholders of record or by less than 500 shareholders of record if the firm has a low level of assets.

Bharath & Ditmar (2010) make use of SEC's Rule 13e-3 to identify whether a "true going private" transaction has occurred, as US companies must file 13E-3 schedules whenever they are involved in these types of dealings. According to the researchers, the Rule 13e-3 includes MBOs and LBOs by a financial sponsor, as well as acquisitions of a public company by a private one that result on the target's delisting of public markets.

Notwithstanding, assembling this study's GP sample based on fillings, such as the 13E-3 schedules, was not the path taken, given the broad number of stock exchanges in Europe and the difficult access to such documents. Instead, the study sample, or GP sample, was constructed using the SDC database, making use of this source's definition of a GP transaction. The SDC "flags" an M&A deal as a GP one when a private entity acquires a public company, resulting on the target's delisting of public markets. In addition to the GP filter, only deals in which the target company was a European firm were retrieved, no restrictions being established for the acquirer. In this way, the base sample is constituted by all GP deals available on the SDC database, accounting for 4,383 announced deals between 1983 and 2020.

Moreover, given that this study aims to explore the differences between the fundamental characteristics of companies at IPO and their evolution during public life of a sample group of firms, which exited public markets, and a control sample of companies, which went and remain public, the IPO date of companies must be gathered. This data was collected by considering the first day for which there is a price available on DataStream for a given company. Note that, while this approach may not yield the precise IPO date, after checking for consistency with other data sources for some companies, the DataStream IPO date was often found to be

relatively accurate. Nevertheless, as this study makes use of the IPO year, instead of the precise day, these problems are minimized.

Table 1 provides a comprehensive view of the screens applied to the base sample to build this study's GP sample.

Table 1 – GP sample screens

Table 1 displays the filters applied to the base sample retrieved from the SDC database.

Sample Filters	Number of Firms
Total base sample	4,383
Sample Source: SDC database	
Less	
Firms whose SIC Code starts with 6 (*Financial, Insurance and Real Estate*) or 49 (*Electric, Gas and Sanitary Services*)	(983)
Firms for which the DataStream Code is not given	(433)
Firms for which no IPO date was found or whose IPO Date is *post* announcement date and are "dead", according to DataStream database	(902)
Non-completed deals	(330)
GP sample	1,735

Firstly, similarly to Bharath & Ditmar (2010), deals in which the target firm's SIC code starts with a 6 (*Financial, Insurance and Real Estate*) or a 49 (*Electric, Gas and Sanitary Services*) were removed from the sample. Secondly, deals for which the target's DataStream code was not available were also redrawn, as variables will be constructed based on this database. Thirdly, to ensure target companies had actually been delisted, only firms that were "dead" according to DataStream were kept. Fourthly, transactions whose target firms' IPO date was not found or posterior to the transaction's announcement date were also erased. Finally, deals which were announced, yet not completed, were also removed from the sample. As a result, a screened sample of 1,735 European firms which exited public markets between 1985 and the beginning of 2020 was obtained.

These 1,735 European firms are compared to a control sample of 5,684 publicly traded European enterprises. The control sample was created by retrieving publicly listed firms in all countries in Europe that had firms in the GP sample, for which data was available in the DataStream database. To ensure consistency utility and financial firms were excluded from the control sample, in addition to those whose industry was unclassified.

In order to give a more comprehensive view of the samples used in this study and on the GP activity in Europe, in the following subsection descriptive statistics of the study and control sample will be presented and analyzed.

6.2. Descriptive Statistics

This study will analyze data of 1,735 GP transactions which occurred in 39 different countries in the European Continent (including Russia), being the first research, to my knowledge, to study the GP decision on such a wide range of country-based firms in Europe. Table 2 shows the distribution of both study and control samples across these 39 countries.

While the three main leading nations of the EU, UK, France and Germany, have the highest number of exits from public markets (596, 246 and 129, respectively), data shows the UK to have experienced a significantly larger number of GP transactions over the years, evidencing 350 more deals than the second highest ranked country. Note that, Belkhir et al. (2013) also find France to be the country in Continental Europe to experience a higher number of GP transactions from 2000 to 2009. Closely following Germany, comes Sweden with 121 firms exiting financial markets, a Scandinavian country whose financial system has developed considerably over the past decades (Stenfors, 2014).

Table 2 – Sample distribution by country

Table 2 displays the GP, column (3), control, column (4) and total, column (5), sample distributions across the 39 European countries considered in this study.

No.	Country	GP Sample	Control Sample	Full Sample
(1)	(2)	(3)	(4)	(5)
1	**Austria**	15	42	57
2	**Belgium**	31	77	108
3	**Bulgaria**	13	133	146
4	**Croatia**	9	84	93
5	**Cyprus**	2	40	42
6	**Czech Republic**	12	3	15
7	**Denmark**	45	92	137
8	**Estonia**	2	12	14
9	**Finland**	22	129	151
10	**France**	246	600	846
11	**Germany**	129	482	611
12	**Greece**	23	134	157
13	**Guernsey**	1	0	1
14	**Hungary**	6	22	28
15	**Iceland**	2	13	15
16	**Ireland Republic**	26	22	48
17	**Isle of Man**	2	0	2
18	**Italy**	74	246	320
19	**Jersey**	3	0	3
20	**Latvia**	3	17	20
21	**Liechtenstein**	1	0	1
22	**Lithuania**	10	17	27
23	**Luxembourg**	4	7	11
24	**Monaco**	1	0	1
25	**Netherlands**	52	62	114
26	**Norway**	86	195	281
27	**Poland**	48	583	631
28	**Portugal**	14	36	50
29	**Romania**	12	126	138
30	**Russian Federation**	58	232	290
31	**Serbia**	3	93	96
32	**Slovak Republic**	2	34	36
33	**Slovenia**	6	18	24
34	**Spain**	19	112	131
35	**Sweden**	121	691	812
36	**Switzerland**	28	128	156
37	**Turkey**	5	267	272
38	**Ukraine**	3	36	39
39	**United Kingdom**	596	899	1,495
Total		1,735	5,684	7,419

Table 3 – Sample distribution by IPO and GP year

Table 3 displays the GP sample by going public year, column (2), and GP year, column (4) and the control samples distribution by going public year, column (3).

	Panel A: Nb. of Firms Going Public		Panel B: Nb. of Firms Going Private
Year	**GP Sample**	**Control Sample**	**GP Sample**
(1)	(2)	(3)	(4)
Before 1985	173	60	0
1985	29	17	1
1986	37	63	0
1987	53	33	3
1988	94	199	6
1989	71	100	5
1990	42	69	7
1991	22	43	6
1992	17	43	6
1993	44	40	7
1994	76	97	10
1995	45	92	21
1996	85	120	28
1997	99	172	13
1998	114	225	57
1999	97	193	99
2000	113	254	83
2001	54	117	60
2002	41	89	63
2003	25	60	105
2004	58	145	60
2005	73	204	83
2006	88	374	95
2007	58	310	98
2008	24	149	81
2009	20	204	68
2010	19	170	79
2011	11	219	100
2012	11	164	93
2013	12	155	85
2014	16	248	85
2015	9	245	52
2016	4	243	52
2017	0	310	48
2018	1	247	48
2019	0	183	26
2020	0	28	2
Total	1735	5684	1735

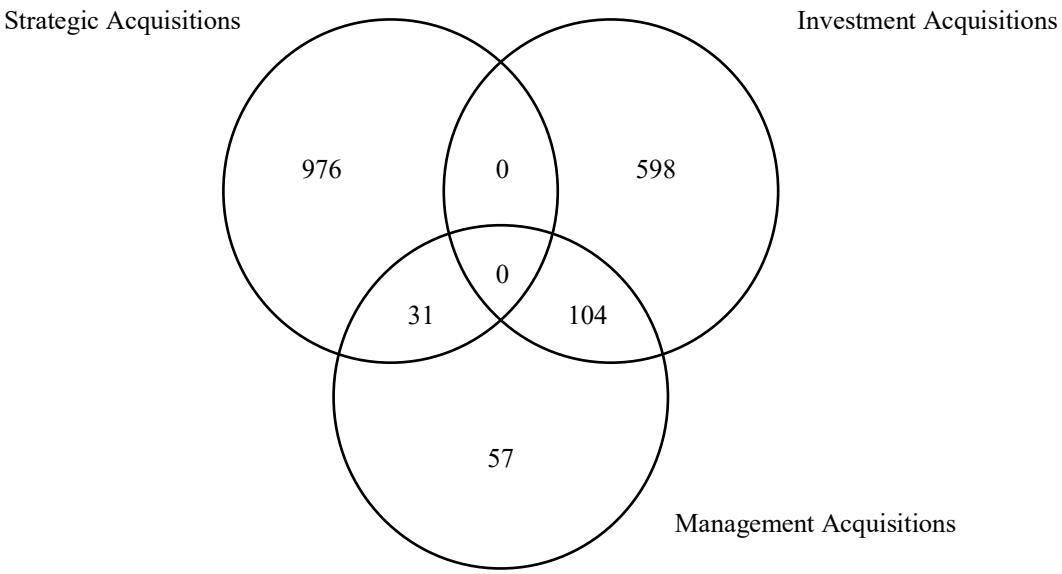
Moreover, the GP sample shows European firms to be public, on average, for 11 years, before departing from public markets. Table 3 allocates both the GP and control samples according to their IPO year and the number of GP deals by delisting year.

Data shows the number of exits from public listings to have increased considerably since 1998, inclusive. From 1998 to 2014, there were, on average, 82 annual deals, varying in a pattern close to cycles of short and low frequency. Since 2015, this type of transactions has been conducted in smaller numbers, with an average of 45 annual deals, from 2015 to 2019.

Furthermore, 72% of the deals recorded are domestic, which could either indicate a preference of financial investors or strategic acquirers to purchase national companies, or a tendency for cross border ultimate parent acquirers to purchase a potential target through an affiliated company located in the same country, for example. Also, 21% of the deals were completed through an LBO.

In figure 1 GP deals are organized in three main categories: *Strategic Acquisitions*, meaning whether the acquirer is a private firm; *Investment Acquisitions*, investors such as private equity funds, venture capitalists or individuals; and *Management Acquisitions*, identifying whether management was involved or was the driver of the deal through a MBO. As illustrated by figure 1, these categories often overlap.

Figure 1 – GP deals grouped by acquirer nature



Bharath & Dittmar (2010) identify almost 32% of their GP sample of US companies to be classified as MBOs. This study finds different statistics in Europe, as only 11% of the transactions recorded management involvement. Additionally, a higher number of transactions backed by private capital is observed, 40% compared to 15.4% in the US. However, while in the US PEs are more likely to invest in an agreement with the incumbent management (44% of the deals backed by private equity), in Europe, 85% of the times, private funds do not involve managers in the transaction. Notwithstanding, in Europe, MBOs are more frequently financed by private funds than by private operating firms, contrarily to the US.

Finally, appendix 1 displays firms of the GP sample grouped by industry, using Kenneth R. French twelve industry classification. The distribution is similar to the one identified in the US by Bharath & Dittmar (2010), as manufacturing, business equipment, retail and consumer durables firms evidence the highest number of GP deals. Notwithstanding, the number of GP healthcare firms is more than double in Europe.

7. Empirical Analysis

7.1. Univariate Analysis

In table 4, the mean and median values of the different variables for each sample in the IPO year are presented. Firms which later go private show different characteristics at the listing year, compared to firms which remain traded in stock exchanges. More precisely, GP firms are smaller, in terms of average sales, market value and assets, have higher levels of FCF and NFA and lower levels of cash, all scaled by company assets, and pay more frequently dividends during the IPO year. These results are robust to both mean and median comparison tests at the 1% significance level. Less significant results identify GP firms to be less financially constrained, as measured by the KZ index, more liquid, and have higher levels of leverage. No differences are found in R&D levels scaled by sales, the number of acquisitions or the market-to-book ratio. Note that, due to the lack of information on some companies, the number of firms included in the computations of the many variables varies.

These statistics are relatively different from the ones identified in the US by Bharath & Dittmar (2010). Considering any significance level at either mean or median difference tests between the study and control samples to be relevant, the previously mentioned authors find GP firms in the US to have higher assets and sales volume, lower level of R&D-to-sales, lower CAPEX-to-sales, less liquidity and lower market-to-book ratios, in contrast to this study's findings in the European market. Statistics propose size to be more relevant for European companies in the GP decision than for US firms, suggesting European markets to be less attractive for SMEs. Furthermore, the only variable not found statistically significant in the US was the number of acquisitions.

Table 5 presents mean and median summary statistics of GP firms at IPO year and the year prior to the stock delisting. Note that, descriptive statistics presented in column A of this table differ from those of column A of table 4, since in table 5 only companies which had data on the two years being examined are included, to ensure consistency in the analysis.

Table 4 – Mean and median statistics of the GP and control samples at IPO year

Table 4 displays the mean (1st line) and median (2nd line) values and the number of observations (3rd line) of each firm characteristic of the GP, column A, and control, column B, samples at IPO. The last column presents the t-stat (chi-square) of the test of difference in means (medians). *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

	GP Sample t = IPO year (A)	**Control Sample** t = IPO year (B)	**Difference** t-stat / chi-square (B)-(A)
Sales	235.16	460.13	3.85***
	41.78	25.74	36.63***
	1,078	3,967	
Assets	253.84	579.29	3.63***
	48.71	36.80	10.27***
	1,077	3,950	
Market Value	193.34	504.70	5.17***
	39.66	55.50	25.01***
	1,609	3,886	
R&D_S	2.38	6.20	1.47
	0.02	0.03	0.75
	158	677	
ILLIQ	0.02	0.03	1.41
	0.00	0.00	29.21***
	1,078	3,290	
Turnover	0.73	0.93	0.88
	0.21	0.17	11.30***
	787	3,403	
CAPEX_S	0.37	2.51	1.04
	0.05	0.03	65.97***
	956	2,743	
KZ_I	-27.28	-79.83	-2.24**
	-0.90	-1.74	2.44
	240	1,146	
Dividend Dummy	0.47	0.34	-7.28***
	0.00	0.00	55.67***
	1,010	3,583	
Acquisitions (IPO)	0.18	0.17	-0.58
	0.00	0.00	1.93
	1,612	5,676	
MB	4.50	7.92	1.48
	1.84	1.89	1.02
	1,047	3,879	
Leverage	0.13	0.13	-0.78
	0.07	0.06	3.66*
	1,071	3,736	
FCF_A	0.03	-0.30	-3.82***
	0.06	-0.09	19.84***
	752	3,198	
Cash_A	0.20	0.25	6.63***
	0.13	0.15	9.81***
	1,075	3,939	
NFA_A	0.26	0.22	-5.40***
	0.19	0.14	31.41***
	1,072	3,833	

Table 5 – Mean and median statistics of the GP sample at IPO and year prior to GP

Table 5 displays the mean (1st line) and median (2nd line) values and the number of observations (3rd line) of each firm characteristic of the GP sample at IPO, column (A), and at the year prior to going private, column (B). The last column presents the t-stat (sign test significance) of the test of difference in means (medians). *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

	GP Sample t = IPO year (A)	**GP Sample** t = Year prior to going private (B)	**Difference** Paired t-test / Sign test (B)-(A)
Sales	238.89 42.86 996	467.89 108.01	6.64*** ***
Assets	261.30 52.412 981	536.44 109.27	4.96*** ***
Market Value	189.98 38.96 1,588	307.62 47.29	4.22*** ***
R&D_S	2.41 0.03 115	8.57 0.02	0.72
ILLIQ	0.02 0.00 1,032	0.14 0.00	1.23 ***
Turnover	0.77 0.22 694	0.25 0.11	-4.10*** ***
CAPEX_S	0.41 0.05 835	0.53 0.03	0.46 ***
KZ_I	-6.36 -0.91 105	-10.27 -1.63	-1.11
Dividend Dummy	0.48 0.00 891	0.55 1.00	4.01*** ***
Acquisitions (IPO)	0.18 0.00 1,590	0.22 0.00	1.79* ***
MB	4.56 1.84 953	1.53 1.24	-2.02** ***
Leverage	0.13 0.07 965	0.15 0.10	3.34*** **
FCF_A	0.03 0.06 657	0.00 0.06	-1.93* ***
Cash_A	0.21 0.13 976	0.14 0.08	-10.29*** ***
NFA_A	0.26 0.20 974	0.26 0.20	0.79

Statistics on size show GP European firms to grow in sales, assets and market value during their public life. Furthermore, there is substantial evidence of a decrease in turnover, indicating a decrease in liquidity, an increase in the number of acquisitions, suggesting GP firms to be active for corporate control during their public life, an increase in leverage and a decrease in the market-to-book, FCF and cash ratios. One interesting finding is that between the IPO year and the year prior to delisting the average market-to-book ratio decreases considerably. While this can be linked to a company's activity in the M&A market, it also represents a drop in the premium the market puts on the firm. In this way, this could corroborate theories on undervaluation motives in Europe documented in past literature.

Appendix 2 displays the trend of assets, turnover, market-to-book ratio and FCF average values of both study and control samples during the first and last five years of firms' public life. To ensure a satisfactory level of consistency, while preserving a reasonable number of sample firms, only firms which were public for more than seven years were considered in the construction of these graphs. Graphs show variables to evolve in similar trends in both samples in the first five years of public life, although exhibiting considerable gaps in average values. Firms which remained public are consistently larger in terms of assets, have higher stock turnover, higher market-to-book ratios and considerably lower FCFs.

Panel A of appendix 3 contrasts the cumulative average number of acquisitions for GP firms whose public life was under and over five years. A considerable gap exists between the two lines, which could support the idea that some firms might go private only for a couple of years seeking to engage in a few acquisitions. Moreover, Panel B of appendix 3 exhibits the average number of acquisitions around the delisting year (*Private 0*) for firms that went private before 2016 and had a public life of at least five years. The trend suggests firms engage in a significantly higher number of acquisitions during public life, also supporting the idea that firms seek stock exchange listings to carry out M&A transactions.

Note that, while table 4 suggests GP companies and firms which remain publicly listed to have inherent dissimilar characteristics at IPO, table 5 shows these characteristics to vary considerably over the public life of a company. If firms which later go private have substantially different characteristics at IPO from those that remain public, it could be the case that a firm should not have gone public in the first place or that these companies go public with a planned exit. Nevertheless, listing on public markets is associated with high costs, hence the decision to go public not being made lightly. If going public benefits are slightly above costs, changes in

firm characteristics or market conditions, many times not foreseen by company managers or advisors, may also determine delisting decisions.

7.2. Logit Analysis

Table 6 presents the results of a logit analysis performed using firm characteristics at IPO. The dependent variable is a dummy equal to one if the firm went private and equal to zero otherwise. In contrast to other statistical analyses presented further in this study, the natural logarithm of market value is used to proxy firm size, instead of the natural logarithm of sales. This is due to the fact that the latter exhibits a significant degree of correlation with other variables, namely R&D-to-sales, which could disrupt results. Moreover, the FCF-to-sales variable is also not included in any of the four logit regressions, as it holds a sizable negative correlation with the market-to-book ratio. Nevertheless, a similar analysis was performed regressing FCF in place of the market-to-book ratio, in which the first was found not to be statistically significant, not supporting the agency hypothesis. This analysis is presented in appendix 4.

Regression 1 explores the impact of all firm characteristics at IPO, except for sales, assets and FCF, described previously in table 4, presented in subsection 7.1. Results indicate that larger firms, with high R&D expenditures and low CAPEX as a percentage of sales at the listing year, are less likely to go private. Consequently, findings support the size considerations that smaller firms are more likely to go private due to low information availability or to high costs associated with remaining publicly listed, among others. Nevertheless, the serendipitous information hypothesis is rejected, since high tech firms, with high R&D expenditures and low availability of serendipitous information (Subrahmanyam & Titman, 1999), are more prone to remain publicly listed. Furthermore, results also reject the financially constrained hypothesis 1, as, firms with higher CAPEX-to-sales, in turn, associated with more growth opportunities, are more likely to go private, and the KZ index and the dividend dummy are not found significant. Finally, firms characterized by an inferior amount of leverage and a sizable market-to-book ratio at IPO are more likely to exit public markets. Therefore, the sign and significance of the leverage coefficient hint for the potential importance of the agency hypothesis, as low leverage firms are more likely to suffer from agency problems. Despite the significance of the market-to-book ratio, since the acquisitions variable is not significant, so far, it does not seem wise to comment on the reliability of the control hypothesis.

Table 6 – Logit regressions on the odds of a firm GP using firm characteristics at IPO

Table 6 displays the results of the logit analysis on the likelihood of a firm going private based on firm characteristics at going public year. The dependent variable is a dummy equal to 1 if a firm goes private and 0 otherwise. The table presents the coefficients and, in parentheses, the standard errors. At the end of the table, the number of observations, the pseudo R-squared and the likelihood ratio (LR) chi-square are displayed, for each regression. Variables are defined in appendix 5. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Variables	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**
Intercept	0.127	-0.516***	0.239	-0.487***
	(0.650)	(0.160)	(0.672)	(0.163)
ln(MV)	-0.205**	-0.127***	-0.201**	-0.151***
	(0.096)	(0.029)	(0.102)	(0.030)
R&D_S	-0.778**		-0.838**	
	(0.357)		(0.368)	
ILLIQ	9.576	-1.486	3.626	-1.646
	(6.262)	(1.099)	(6.555)	(1.176)
Turnover	-0.061	0.029	-0.070	0.031
	(0.068)	(0.019)	(0.068)	(0.019)
CAPEX_S	5.218***	-0.001	5.725***	-0.002
	(1.646)	(0.007)	(1.712)	(0.010)
Dividend	-0.259	0.176*	-0.232	0.200**
	(0.397)	(0.099)	(0.425)	(0.102)
KZ_I	0.003		0.003	
	(0.003)		(0.003)	
Acquisitions (IPO)	0.149	0.047		
	(0.171)	(0.059)		
MB	0.090**	0.008	0.093**	0.010
	(0.042)	(0.007)	(0.150)	(0.046)
Leverage	-1.660*	-0.678**	-2.562**	-1.026***
	(0.979)	(0.289)	(0.042)	(0.007)
Cash_A	-0.773	-0.098	-0.828	-0.134
	(0.953)	(0.241)	(1.300)	(0.321)
NFA_A	-1.043	1.141***	-2.134	1.195***
	(1.218)	(0.233)	(0.985)	(0.248)
Acquisitions (IPO + 1)			0.276*	0.149***
			(1.465)	(0.242)
Obs	260	2,246	255	2,210
Pseudo R-Squared	0.154	0.021	0.178	0.029
LR Chi-Square	43.64***	57.59***	47.73***	76.47***

Although regression 1 has a pseudo R-squared of 15.4%, higher than the ones reported by Bharath & Dittmar (2010) in a similar analysis (6-8%), the number of observations is relatively low[6], raising concerns on the reliability of the logit regression and on the applicability of these results to a larger sample of firms. The number of observations is significantly reduced by the lack of data for R&D and the KZ index. In this way, regression 2 excludes these two variables, increasing the number of observations to 2,246, though decreasing the pseudo R-squared.

Coefficients on size and leverage of regression 2 are consistent in sign and evince further statistical significance as compared to regression 1. Furthermore, although CAPEX-to-sales has lost its significance, this regression suggests high property, plant and equipment firms, in general, associated with high capital expenditures, to be more likely to go private. Additionally, howbeit the market-to-book ratio has lost significance, the frequency with which a company pays dividends at the IPO year has a statistically significant positive correlation with the likelihood of going private.

Previously, mean and median differences analysis highlighted the insignificance of the number of acquisitions at IPO year, which is sustained by the logit analysis. Nevertheless, the overwhelming procedures of listing in a public stock exchange may cause firms which go public to follow an acquisition strategy to delay their activity in M&A deals. In this way, regression 3 and 4, which are similar in every other aspect to regressions 1 and 2, respectively, have been run to study whether the number of acquisitions in the year following IPO (IPO + 1) affects the probability of a firm going private. Indeed, a positive and significant relationship was found, suggesting the benefits of being public to engage in M&A transactions to be important in a firm's decision to go public. In turn, if instead of being a long-term strategy, firms go public to engage in a specific or a small number of acquisitions, they may exit public markets once those transactions have been completed. This hypothesis was previously signaled by panel A of appendix 3, as short-lived public firms conducted, on average, a superior number of acquisitions during the first years of public life, compared to companies with a public life longer than five years. Note that including the number of acquisitions at the year following the IPO has increased the pseudo R-squared to 17.8% (regression 3). Conclusions on other variables are similar to the ones obtained before.

In an analogous analysis, Bharath & Dittmar (2010) find evidence of all information, liquidity and FCF hypotheses. Similarly, this study findings, based on characteristics at IPO, suggest

[6] Regression 1 runs firm characteristics on the probability of going private using 61 firms which exited public markets and 199 which did not.

information considerations to be relevant, as this study identifies a potential misfit of public European markets to SMEs. Contrarily, this study's results indicate companies with low leverage at IPO to be more prone to exit public markets, hence giving support to the financially constrained hypothesis 1. Finally, insignificant liquidity concerns point out to similar stock liquidity in European stock exchanges of both going private and remaining public firms.

In conclusion, firms that eventually exit public markets seem to have different inherent characteristics at IPO than companies which do not. Optimal decisions of managers to go public entail benefits of being traded on a stock exchange for GP firms at IPO to be slightly higher than costs, hence changes during the public life potentially causing this balance to evert. As well, it can signal going public decisions with a planned exit. Non-optimal decisions of managers illustrate European public markets not to be fit for all types of firms. However, when concluding on these results, one should keep in mind that the logit analysis has limitations, as it is a simplistic representation of reality. The following subsection exhibits the survival analysis results of the influence of time-varying firm-specific characteristics on the GP decision.

7.3. Survival Analysis

Table 7 presents the results of the Cox Hazard Model, using panel data since the IPO year to the year prior to going private, in which the dependent variable is the likelihood of a firm exiting public markets.

Regression 1 runs all firm characteristics, including R&D-to-Sales and the KZ index, constraining the number of failures (i.e. GP firms) to 202. This regression's output gives evidence of smaller firms with low market-to-book ratios and low levels of fixed assets as a percentage of total assets to be more likely to go private. As a consequence, the relationship previously identified in the logit analysis between the market-to-book ratio and the NFA-to-assets and the likelihood of going private is an antithesis to the one established by the survival analysis.

Table 7 – Cox Hazard regressions on the hazard rate of GP based on firm characteristics over public life

Table 7 displays the results of the Cox Proportional-Hazard Model on the likelihood of a firm going private based on time-varying firm characteristics over firms' public lives. The table presents the coefficients and, in parentheses, the standard errors. At the end of the table, the total number of observations, the number of failures, i.e. firms for which the GP event occurred, and the likelihood ratio (LR) chi-square are displayed, for each regression. Variables are defined in appendix 5. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Variables	Regression 1	Regression 2	Regression 3	Regression 4
ln(Sales)	-0.187***	-0.118***	-0.187***	-0.116***
	(0.040)	(0.017)	(0.040)	(0.017)
R&D_S	0.001		0.001	
	(0.001)		(0.001)	
ILLIQ	0.362	0.035***	0.361	0.035***
	(0.435)	(0.011)	(0.436)	(0.011)
Turnover	-0.034	-0.159***	-0.034	-0.146**
	(0.082)	(0.058)	(0.082)	(0.058)
CAPEX_S	0.004	0.000	0.004	0.000
	(0.012)	(0.002)	(0.012)	(0.002)
Dividend Dummy	-0.267	-0.112	-0.266	-0.110
	(0.168)	(0.072)	(0.168)	(0.072)
KZ_I	0.000		0.000	
	(0.000)		(0.000)	
Acquisitions	0.084	0.029	0.084	0.031
	(0.086)	(0.038)	(0.086)	(0.038)
MB	-0.131**	-0.102***	-0.131**	-0.098***
	(0.062)	(0.030)	(0.062)	(0.030)
Leverage	0.543	0.324***	0.543	0.315***
	(0.344)	(0.089)	(0.344)	(0.090)
FCF_A	0.009	-0.016	0.008	-0.007
	(0.243)	(0.078)	(0.245)	(0.052)
Cash_A	0.507	0.027	0.506	0.070
	(0.546)	(0.255)	(0.547)	(0.247)
NFA_A	-1.311***	0.012	-1.311***	0.017
	(0.477)	(0.142)	(0.477)	(0.142)
Abnormal Return			0.004	-0.188***
			(0.106)	(0.062)
Obs	11,439	51,918	11,439	51,909
Number of Failures	202	1,047	202	1,047
LR Chi-square	68.73***	108.43***	68.74***	119.31***

Regression 2 verifies the robustness of regression 1 results by excluding R&D-to-sales and the KZ index to increase the number of failures and, consequently, improve the confidence in

results. Regression 2 suggests previous results on NFA scaled by total assets' impact on the decision to go private to restrain to the 202 failures considered previously, as this variable loses significance using a larger sample. Furthermore, size and market-to-book ratio effects on the likelihood of exit appear to be robust. As previously discussed, while in subsection 4.1 the market-to-book ratio was stated to study control considerations on the GP decision, the statistical insignificance of the number of acquisitions variable does not provide the necessary confidence to argue the importance of corporate control. In fact, the market-to-book ratio is often used in literature to proxy for other considerations such as risk or mispricing. Bloomfield & Michaely (2004) argue firms with high market-to-book ratios to be perceived as riskier and overpriced by professional investors and Sannajust et al. (2015) find the typical GP firm to be undervalued. Consequently, undervaluation considerations suggest high market-to-book firms to be less likely to go private, which is consistent with this study findings.

Moreover, both liquidity variables gain significance, supporting the liquidity hypothesis that inferior stock liquidity firms are more likely to go private. Finally, whereas the logit analysis indicates that firm leverage at IPO was negatively correlated to stock market exits, the survival analysis suggests companies with lower leverage have more propensity to remain public, not supporting the agency hypothesis. Recall that it was this study premise that a higher amount of leverage decreased agency problems through superior interest payments that, in turn, decrease cash availability. As Bharath & Dittmar (2010) suggest, this relationship might be explained by the need for restructuring.

Comparing table 6 and table 7 regressions 1 and 2 results, only the coefficient on size is consistent in terms of significance and sign. Although, these two types of analysis are not directly comparable, as, among others, models have different assumptions and regress on different samples, in addition to firm characteristics at the listing year, the path a firm takes during its public life is likely to be essential on a firm's decision to go private.

Regressions 3 and 4 replicate regressions 1 and 2, including abnormal returns of firm stocks. Results show the sign and significance of other variables coefficients not to change and, when considering a higher number of failures (regression 4), abnormal returns are statistically significant in predicting a stock market exit. The relation implies firms with high abnormal returns to be more likely to remain listed.

In this way, using the Cox Hazard Model to predict the likelihood of a GP transaction, according to firm characteristics, we conclude firms are more likely to go private if they are small, illiquid,

have low market-to-book ratios and large amounts of leverage. This supports size and liquidity hypothesis. Despite the significance of the market-to-book ratio, as the acquisitions variable coefficient is not significant, it is not reasonable to conclude there is evidence of the control hypothesis. A low market-to-book ratio may also be associated with underpricing, characteristic previous literature (e.g. Renneboog et al., 2006 and Sannajust et al., 2015) found to be linked to GP transactions. Further, it rejects the window of opportunity hypothesis as high stock market performers are more likely to remain publicly traded. Leverage results are different from the ones expected. A higher propensity of high leverage firms going private is not consistent with the agency hypothesis. Given that, the ratio of NFA-to-assets is only statistically significant using a restricted sample and that no other proxies for agency considerations are both consistent with theory and significant, no evidence for the agency hypothesis is found. Finally, table 7 results also do not support the financially constrained hypothesis.

At odds, in the US, the survival analysis conveyed by Bharath & Dittmar (2010) indicates large firms to be more likely to go private. Nevertheless, authors find the lack of information availability, as measured by the number of analysts following the firm, to be associated with a higher hazard rate of going private. Regarding liquidity, researchers' results are weaker, as despite arriving at similar conclusions on the turnover coefficient, the *ILLIQ* variable is not significant. Moreover, both the market-to-book ratio and the number of acquisitions are significant and consistent with the control hypothesis. The agency hypothesis is supported by the correspondence between high cash and FCF-to-assets ratios and higher hazard rate of going private. Nevertheless, the coefficient on FCF is only significant in an early subsample period. Finally, contrarily to this study, the significance and sign of the KZ index and the dividend dummy support access to capital considerations.

Table 8 – Cox Hazard regressions on the hazard rate of GP based on firm-specific and macro environment characteristics over public life

Table 8 displays the results of the Cox Proportional-Hazard Model on the likelihood of a firm going private based on time-varying firm and macro environment characteristics over firms' public lives. The table presents the coefficients and, in parentheses, the standard errors. At the end of the table, the total number of observations, the number of failures, i.e. firms for which the GP event occurred, and the likelihood ratio (LR) chi-square are displayed, for each regression. Variables are defined in appendix 5. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Variables	Regression 1	Regression 2	Regression 3	Regression 4	Regression 5
ln(Sales)	-0.119***	-0.149***	-0.119***	-0.097***	-0.097***
	(0.017)	(0.017)	(0.017)	(0.019)	(0.019)
ILLIQ	0.030***	0.033***	0.036***	0.040***	0.033***
	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)
Turnover	-0.136**	0.000	-0.171***	-0.283***	-0.284***
	(0.060)	(0.007)	(0.060)	(0.080)	(0.079)
CAPEX_S	0.000	0.000	0.000	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Dividend Dummy	-0.178**	-0.281***	-0.125*	-0.389***	-0.383***
	(0.071)	(0.070)	(0.072)	(0.081)	(0.081)
Acquisitions	0.023	0.025	0.024	-0.023	-0.011
	(0.037)	(0.039)	(0.038)	(0.046)	(0.046)
MB	-0.066**	-0.071**	-0.114****	-0.111***	-0.100***
	(0.028)	(0.030)	(0.031)	(0.034)	(0.033)
Leverage	0.330***	0.256***	0.350***	0.440***	0.417***
	(0.079)	(0.088)	(0.090)	(0.085)	(0.085)
FCF_A	0.007	-0.002	-0.009	0.001	0.003
	(0.039)	(0.034)	(0.058)	(0.050)	(0.041)
Cash_A	0.066	-0.006	0.070	0.110	0.082
	(0.244)	(0.245)	(0.249)	(0.273)	(0.273)
NFA_A	-0.114	0.232	-0.005	-0.294*	-0.297*
	(0.143)	(0.142)	(0.142)	(0.166)	(0.167)
Abnormal Return	-0.225***	-0.136**	-0.178***	-0.015	-0.076
	(0.061)	(0.059)	(0.061)	(0.053)	(0.060)
PE Investment Amount	-0.023***				
	(0.002)				
ESI		-0.018***			
		(0.004)			
Number of IPOs		-0.150***			
		(0.024)			
Number of SEOs		-0.900***			
		(0.057)			
Number of Bond Issues			0.414***		
			(0.057)		
EA Int. Rate on Bus. Loans				0.467***	
				(0.027)	
EA Banks Loans to PIB					7.614***
					(0.462)
Obs	51,892	51,909	51,909	44,235	44,235
Number of Failures	1,047	1,047	1,047	811	811
LR Chi-Square	427.68***	1381.14***	167.04***	379.39***	363.28***

In this way, European GP transactions are perceived to exhibit different motivation characteristics than the ones in the US. This analysis is complemented by considering the effect of changes on the macro environment on firm characteristics and on the decision to go private itself.

The regressions' output of the probability to go private on firm characteristics and macro variables, using the Cox Hazard Model, are described in table 8. Regressions were carefully built in order to minimize the existence of correlated variables in the same explanatory model. To avoid restricting the study sample to a small number of firms, the R&D-to-sales and the KZ index variables were not included, hence firm-specific variables are the ones admitted in regression 4 of table 7.

Firstly, regression 1, in addition to firm characteristics, considers the amount invested by PEs and VCs during a given fiscal year, in billion euros. Results reject the private equity hypothesis, as an increase in the amount invested leads to a decrease in the likelihood of firms going private. These results suggest that private equity investors are still more prone to invest in private firms, even when funding is high. In this way, the European GP market seems not to be driven by the private equity investment amount.

Secondly, regression 2 studies the impact of the ESI and the number of IPOs and SEOs on the decision to go private. As expected, in periods in which confidence is low, firms are more likely to exit public markets, providing evidence for the confidence hypothesis. In turn, periods in which there is a high volume of IPOs are associated with a higher probability of firms remaining public, suggesting that when stock markets are suitable to enter, fewer firms wish to leave public markets. Additionally, in intensified SEO markets, associated with a lower cost to raise external capital, companies are less inclined to go private, consistently with the financially constrained hypothesis 2.

Thirdly, regression 3 considers, in addition to firm characteristics, the number of bond issues. The coefficient of this macro variable indicates strong bond markets, an alternative source of funding to equity and other types of debt financing, to be associated with increased expectations of GP transactions. Hence, further supporting the financially constrained hypothesis 2.

Fourthly, regression 4 analyzes the impact of the Euro Area interest rate on business loans to non-financial companies on the expectations of GP transactions. The model exhibits interest rates on business loans to be significantly and positively related to the likelihood of going private, neglecting the bank loan hypothesis regarding interest rates. Whereas the inverse

relationship was expected, as this variable measures the price of bank loans, which are an alternative source of funding to equity financing, two main reasons for this relationship can be identified. Firstly, in addition to this variable being constrained to euro area data, it is also limited to a small period of time and, despite the latter not affecting the accuracy of regressions, as the Cox Hazard Model only uses observations for which it has sufficient information on, it restricts the time period analysis. Secondly, by analyzing the data, one can verify that in periods of financial crisis, as it was the case in 2008 and 2009, the demand for capital increases substantially, consequently raising its price. In turn, as demonstrated by the ESI coefficient of regression 2, periods of financial crisis and low confidence are associated with a higher number of GP transactions.

Lastly, in regression 5, the Euro Area new bank loans amount impact was also studied. The coefficient evidences a positive and significant relationship between this variable and the likelihood of an exit, thus supporting the bank loans hypothesis. Bank loans are not only an alternative source of financing for companies as also a traditional means of financing of GP transactions (LBOs). Nevertheless, this analysis has the same shortcomings as regression 3, regarding the availability of data.

When macro variables are included, previous subsection results on size, liquidity, leverage and abnormal returns are consistent with the exception of abnormal returns on regression 4 of table 8, which loses significance. Furthermore, by controlling the regression to the macro environment, the dividend dummy has gained significance, implying companies which pay more frequently dividends to be less likely to exit public markets. While in subsection 4.1 has been conjectured that low dividend frequency paying firms would be more financially constrained, hence this finding rejecting the financially constrained hypothesis 1, it can also be the case that managers use dividends to signal sound financial health and future growth prospects to investors (Bhattacharya, 1979).

Indeed, the GP decision in Europe appears to be the result of both macro and firm-specific characteristics. Despite their relationship with the dependent variable, in this empirical study, macro variables always exhibit a high significance level, indicating the macro environment to be very important in determining stock market exits.

Up to this point in the analysis, the 39 different European countries, whose firms' characteristics have enabled this broad analysis of the European GP transaction determinants, have been treated as one large country whose corporate landscapes, legal environment and financial

markets are similar. In reality, many of these countries have significant differences which may entail different considerations and motivations in the decision to exit public stock markets. Consequently, this study analysis was complemented with a subgroup analysis in efforts to determine whether country-specific characteristics can alter results.

Four subsample groups were built according to their economic influences. Group 1 is constituted by countries of English influence (Guernsey, Isle of Man, Ireland Republic and the UK), group 2 by Central Europe and South origin countries (Austria, Belgium, Czech Republic, France, Germany, Greece, Italy, Liechtenstein, Luxembourg, Monaco, the Netherlands, Portugal, Slovak Republic, Spain and Switzerland), group 3 by Eastern Europe countries (Bulgaria, Croatia, Cyprus, Hungary, Poland, Romania, Russian Federation, Serbia, Slovenia, Turkey and Ukraine) and, finally group 4 is composed by countries of Scandinavian influence (Denmark, Estonia, Finland, Iceland, Latvia, Lithuania, Norway and Sweden). Appendix 6 presents a list of the different subsample groups constituents and the corresponding number of firms considered. Note that, the construction of all different groups does not entail a perfect homogeneity of corporate and financial markets environment. Many differences still persist within the groups. Nevertheless, the number of observations limits, to a considerable extent, the in-depth with which this subsample analysis can be performed. Still, it should provide adequate insights on how country differences can impact the GP decision.

Table 9 displays the hazard model estimation of the subgroup survival analysis, using firm characteristics, in which panel A, B, C and D present the results of groups 1, 2, 3 and 4, respectively.

Table 9 – Cox Hazard regressions of the subsample analysis on the hazard rate of GP based on firm characteristics over public life

Table 9 displays the results of the Cox Proportional-Hazard Model on the likelihood of a firm going private based on time-varying firm characteristics over firms' public lives. Regressions differ on the subsample of firms considered: firms of English influence countries, panel A, Central and South European firms, panel B, East Europe firms, panel C, and Scandinavian ones, panel D. For a more comprehensive view of the subsample groups see appendix 6. The table presents the coefficients and, in parentheses, the standard errors. At the end of the table, the total number of observations, the number of failures, i.e. firms for which the GP event occurred, and the likelihood ratio (LR) chi-square are displayed, for each regression. Variables are defined in appendix 5. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Variables	**Panel A: Group 1**	**Panel B: Group 2**	**Panel C: Group 3**	**Panel D: Group 4**
ln(Sales)	-0.122***	-0.182***	0.077	-0.128***
	(0.028)	(0.031)	(0.065)	(0.039)
ILLIQ	0.364	-5.765***	0.047***	0.217
	(1.177)	(1.464)	(0.011)	(0.183)
Turnover	-0.017	-0.060	-1.446	0.125***
	(0.031)	(0.151)	(0.414)	(0.039)
CAPEX_S	-0.001	-0.003	-0.026	-0.002
	(0.003)	(0.010)	(0.101)	(0.008)
Dividend Dummy	-0.062	-0.130	-1.081	-0.314*
	(0.127)	(0.116)	(0.281)	(0.170)
Acquisitions	0.088	-0.268***	0.097	0.050
	(0.057)	(0.101)	(0.172)	(0.077)
MB	-0.229***	-0.048	-0.062	-0.192***
	(0.058)	(0.049)	(0.135)	(0.074)
Leverage	0.552***	0.113	0.826***	0.364
	(0.153)	(0.203)	(0.290)	(0.410)
FCF_A	0.316	-0.075	0.111	-0.059
	(0.279)	(0.344)	(0.379)	(0.084)
Cash_A	0.005	-0.527	-0.161	0.051
	(0.509)	(0.533)	(1.377)	(0.567)
NFA_A	0.761***	-0.559**	0.307	0.113
	(0.194)	(0.263)	(0.523)	(0.341)
Abnormal Return	-0.538***	0.045	-0.017	-0.124
	(0.120)	(0.054)	(0.143)	(0.132)
Obs	9,580	21,181	10,542	10,606
Number of Failures	359	421	73	194
LR Chi-Square	102,30***	87,21***	61,14***	45,85***

Panel A shows companies of English influence countries to be more likely to exit public markets if they are small, have low market-to-book ratios, high leverage, high NFA-to-assets ratios and experienced lower abnormal returns. Thus, results are consistent with the size hypothesis, although inconsistent with the window of opportunity hypotheses, as the inverse relationship is proven and significant. FCF and cash-to-assets variables remain insignificant and leverage and the NFA-to-assets ratio exhibit the opposite relation to the one expected, hence not sustaining the financially constrained hypothesis 1, similarly to Renneboog et al. (2006) findings in the UK. Finally, the market-to-book ratio coefficient supports the idea that undervalued firms are more prone to exit public markets, a relationship also identified by Renneboog et al. (2006).

Panel B indicates firms of Central and South Europe countries to be more likely to exit public markets if they are small, enjoy stock liquidity, have conducted few acquisitions over their public life and have low ratios of NFA-to-assets. Consequently, the output supports size and control hypotheses. Findings on liquidity considerations, however, are peculiar, as illiquidity is a characteristic more prevalent in firms which remain public. Moreover, the NFA-to-assets ratio also exhibits the expected relationship at a statistically significant level, supporting the financially constrained hypothesis. Recall that large NFA firms are, in general, more capital intensive, hence needing large amounts of funding. Consistently with Belkhir et al. (2013) findings in France, there is no evidence of low growth opportunities to be a determinant in delisting decisions. Inconsistently, undervaluation and FCF considerations are not supported by this subsample group analysis. Furthermore, this analysis also supports smaller firms to be more likely to delist, a relationship not identified in Italy by Bettinelli et al. (2011).

Panel C highlights the importance of firm leverage for Eastern European firms in the likelihood of going public, as high leverage firms are more prone to exit stock markets, suggesting the existence of restructuring motives in the GP decision. Furthermore, consistent with the liquidity hypothesis, companies with illiquid stocks are also more likely to delist from stock exchanges. Notwithstanding, as the number of failures is relatively small, these results may not sustain in broader sample analysis.

Lastly, Panel D underlines companies of countries with Scandinavian influence to be more likely to go private if they are small, have high turnover, distribute dividends with low frequency and exhibit low market-to-book ratios. In turn, results are consistent with the size hypothesis and the idea that undervalued firms go private. Nevertheless, they are inconsistent with liquidity considerations and the financially constrained hypothesis 1.

In conclusion, the empirical results of this study indicate country-specific characteristics, such as financial markets functioning and corporate culture, to be prominent on the determinants of GP transactions. Still, some firm-specific characteristics, as size, market-to-book ratios or leverage, are consistently relevant in the GP decision.

When analyzing results displayed in table 9, one should keep in mind that this analysis has limitations. More precisely, subsample groups' constituents still possess significant differences regarding financial markets functioning, legal environment and corporate culture, hence results potentially being driven by large observation countries. Additionally, a small subsample of observations for such an extensive period of study may also mislead results. Furthermore, the control group was created for a full sample analysis rather than a subsample one.

8. Conclusion and Future Research

This study aims to provide a broad, exhaustive and comprehensive view of the determinants of GP transactions in Europe based on firm-specific and macro environment characteristics. The sample under analysis is constituted by 1,735 firms which went private in 39 different European countries between 1985 and 2020 and 5,684 companies that remain, to the sample collection moment, publicly listed in European stock markets. Following Bharath & Dittmar (2010), an extensive statistical analysis is conducted, comprising univariate, logit and survival analyses.

The univariate analysis results highlight two main thoughts. Firstly, mean and median values of GP firms' characteristics at the IPO year are often statistically different from the ones of companies that remain publicly listed. Secondly, firm-specific characteristics of GP companies change considerably over their public life. In this way, the univariate analysis suggests both inherent characteristics at IPO and their evolution over time to be relevant in determining a GP transaction. In turn, the logit analysis also supports this idea that European companies, which later exit public stock markets, have distinctive characteristics at IPO. GP firms are recurrently found to be smaller in market value and have lower amounts of leverage at the listing year.

This study's most complete statistical analysis, and least common in this field of research, is the survival analysis, using the Cox Hazard model. Substantial evidence is found that European stock markets are more fit to large firms than SMEs and the liquidity benefits of publicly listed firms to be an important factor in the decision to remain publicly listed. Furthermore, results also sustain the idea that undervalued firms and companies that experience low abnormal returns are more prone to delist from public markets, strengthening the idea that stock performance weights on the GP decision. Moreover, in contrast to the logit analysis, the Cox Model results indicate a firm's leverage amount to be positively correlated with the likelihood of going private, suggesting GP European firms to have acquired significant amounts of leverage during their public life. Finally, no evidence is found that supports agency problems to weight in stock delisting decisions.

All macro variables considered in this study statistically significantly impact the likelihood of a firm going private, indicating that, in addition to firm characteristics, the macro environment is a critical determinant of GP transactions. Analyzing a variety of external factors, this study finds PE investment amounts not to be a driver of GP transactions and business cycles and agent confidence to be relevant in stock market delisting. Additionally, periods of hot IPO markets

are associated with a lower likelihood of firms going private, suggesting fewer firms wish to delist their stocks when financial markets are favorable for new entrants.

Regarding access to capital considerations, while there is no evidence indicating firms which remain public to be more financially constrained, the supply of alternative sources of funding does impact the GP decision. More precisely, firms are more likely to remain public in times of favorable SEO markets and more prone to exit in times of hot bond markets and high bank loans supply.

Finally, while the subsample group analysis indicates some characteristics, such as size or leverage, to be common determinants in the GP decision in different markets, the importance of other factors varies considerably. In this way, European regulatory authorities should focus their efforts to create more affable public stock markets on a country by country basis or on a group by group basis of countries with similar financial markets and corporate culture. Moreover, it is also likely that the legal environment of each European country impacts to a significant extent the likelihood of going private, an interesting topic for future research. This study could also be complemented by considering the motivations of GP transactions according to industry, as different industries are likely to weight differently the benefits and costs of being public.

Company managers and shareholders should evaluate carefully the benefits and costs of going public. If benefits are slightly above costs, it is likely that macro or firm-specific factors will change in such a way that will evert this balance. In turn, overburden emerging from listing and delisting administrative procedures and compliance costs may significantly harm a company.

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10. Appendices

Appendix 1

GP sample distribution by Kenneth R. French's twelve industry classification

Appendix 1 displays the GP sample distribution by industry groups, according to Kenneth R. French's twelve industry classification.

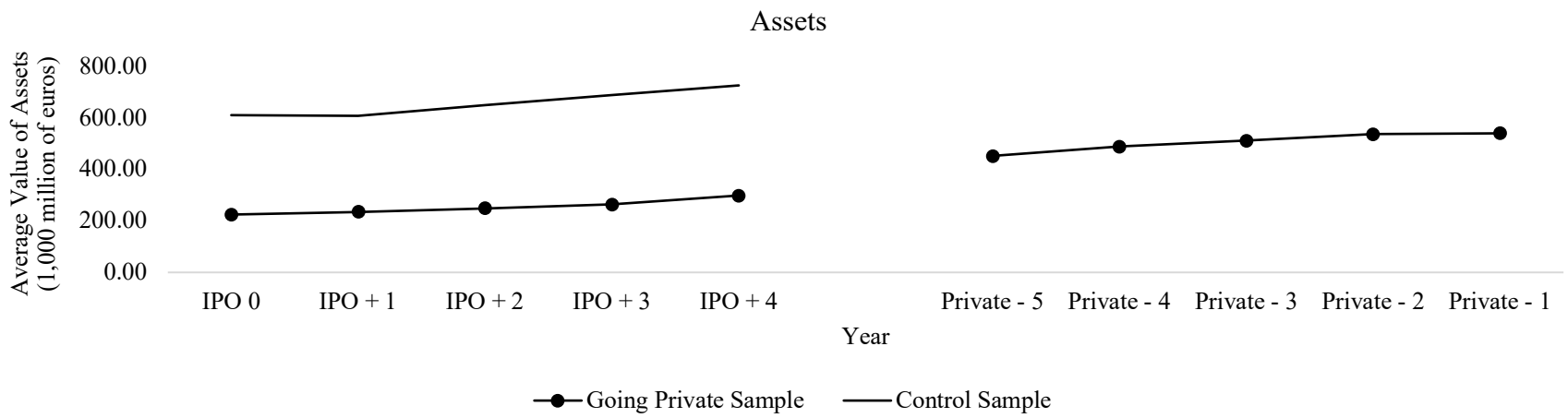
No.	Industry Description	Number of Firms
1	Consumer Nondurables	214
2	Consumer durables	65
3	Manufacturing	477
4	Energy	45
5	Chemicals and Allied Products	46
6	Business Equipment	281
7	Telephone and Television Transmission	51
8	Utilities	0
9	Shops	230
10	Healthcare, Medical Equipment and Drugs	103
11	Finance	0
12	Others	223
Total		1,735

Appendix 2

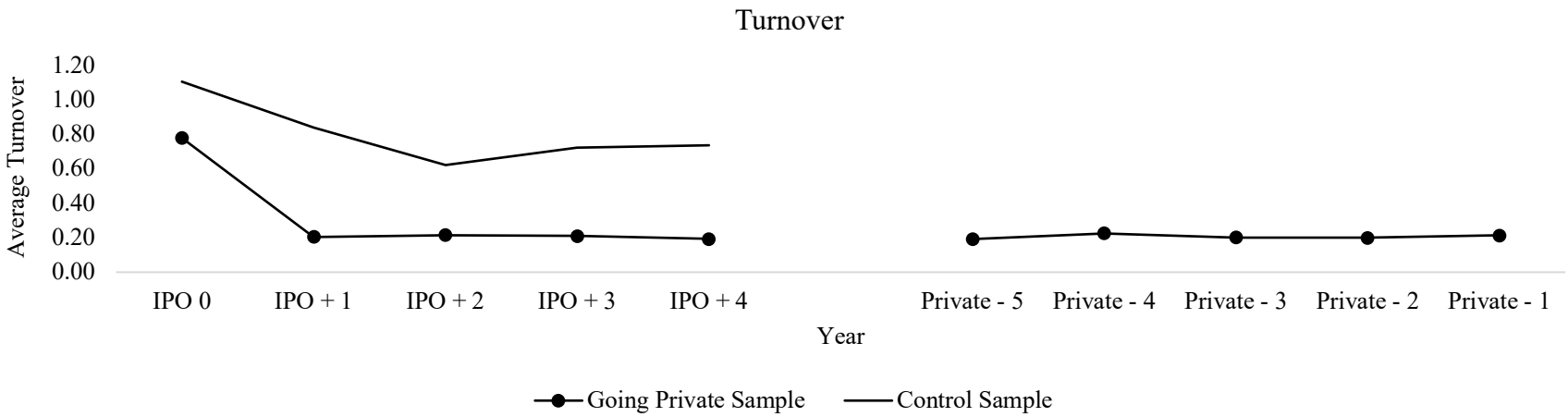
Evolution of firm characteristics after IPO and before GP

Appendix 2 displays the average values of firm characteristics for both control and GP samples, at IPO and the following four years and five years before GP. Only firms whose public life was equal or longer than seven years were included. *IPO 0* is the listing year, *IPO+1* the year following the listing year and so on. *GP-1* is the year prior to the exit of public stock markets and so on. Firm characteristics studied are the value of assets (panel A) turnover (panel B) Market-to-Book ratio (panel C) and FCF-to-assets ratio (panel D).

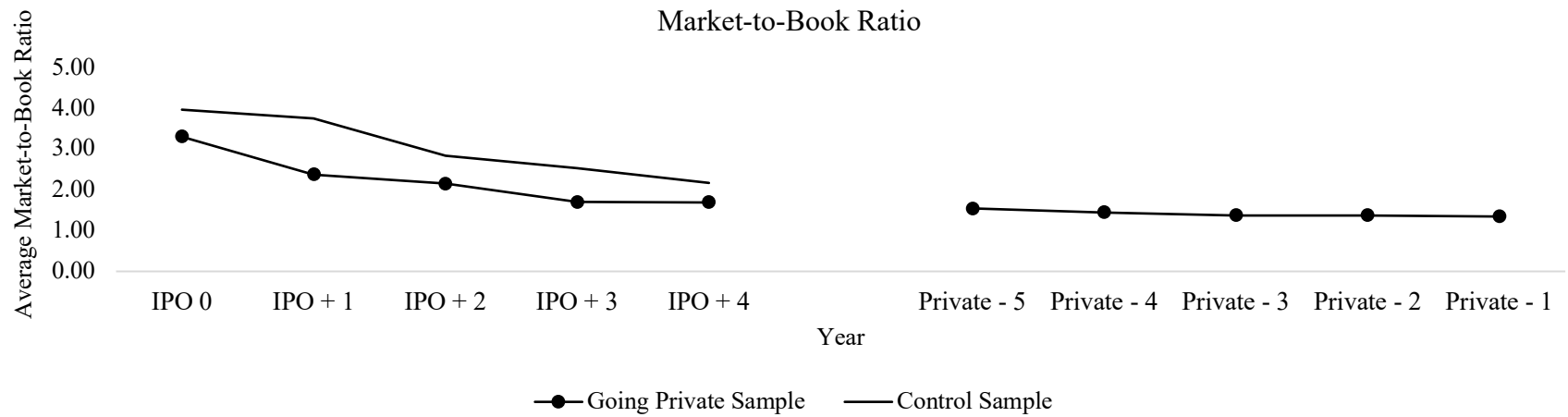
Panel A



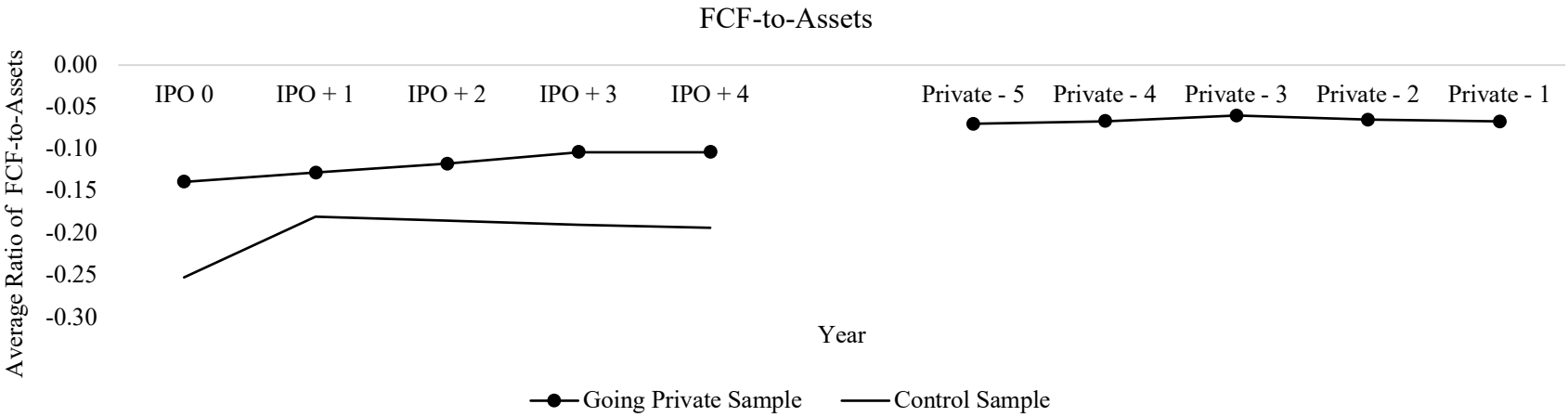
Panel B



Panel C



Panel D

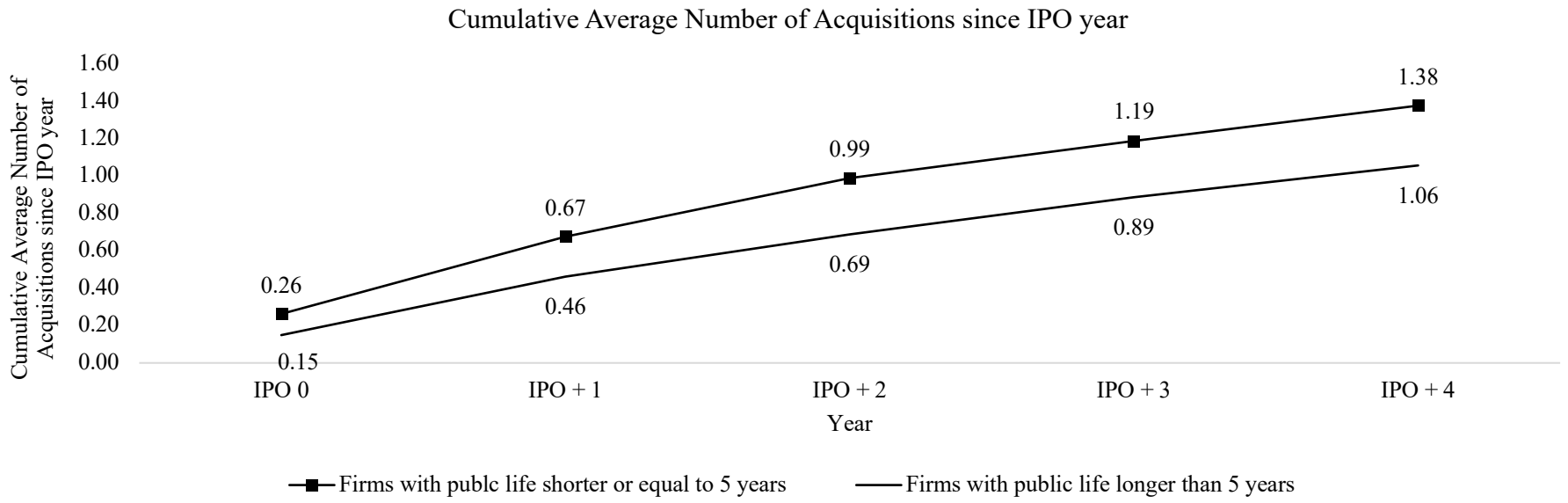

FCF-to-Assets
Average Ratio of FCF-to-Assets
0.00
-0.05
-0.10
-0.15
-0.20
-0.25
-0.30
IPO 0
IPO + 1
IPO + 2
IPO + 3
IPO + 4
Private - 5
Private - 4
Private - 3
Private - 2
Private - 1
Year
Going Private Sample
Control Sample

Appendix 3

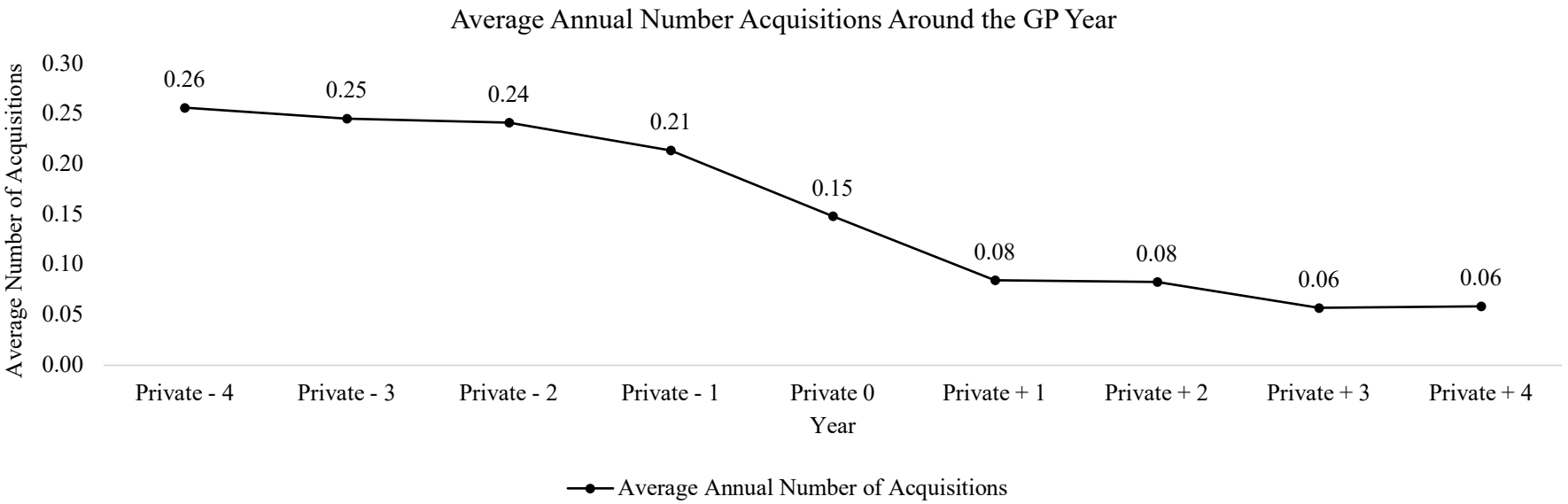
GP firms' involvement in acquisitions

Appendix 3 comprises two panels which study the GP sample firms involvement in acquisitions. Panel A depicts the evolution of the cumulative average number of acquisitions of GP firms at the listing year and the following four years. Two subsample groups of GP firms are considered: firms whose public lives was shorter or equal to five years and those whose public live was longer. *IPO 0* is the listing year, *IPO+1* the year following the listing year and so on. Panel B depicts the average number of acquisitions conducted by GP sample firms around the GP year (*Private 0)*. *Private+1* is the year following and *Private-1* the year prior to stock market delisting and so on.

Panel A



Panel B


Average Annual Number Acquisitions Around the GP Year
Average Number of Acquisitions
0.30
0.25
0.20
0.15
0.10
0.05
0.00
0.26
0.25
0.24
0.21
0.15
0.08
0.08
0.06
0.06
Private - 4
Private - 3
Private - 2
Private - 1
Private 0
Private + 1
Private + 2
Private + 3
Private + 4
Year
Average Annual Number of Acquisitions

Appendix 4

Logit regressions on the odds of a firm GP using firm characteristics at IPO

Appendix 4 displays the results of the logit analysis on the likelihood of a firm going private based on firm characteristics at going public year, using the variable FCF_A, instead of MB. The dependent variable is a dummy equal to 1 if a firm goes private and 0 otherwise. The table presents the coefficients and, in parentheses, the standard errors. At the end of the table, the number of observations, the pseudo R-squared and the likelihood ratio (LR) chi-square are displayed, for each regression. Variables are defined in appendix 5. *, ** and *** indicate significance at the 10%, 5% and 1% level, respectively.

Variables	**Regression 1**	**Regression 2**	**Regression 3**	**Regression 4**
Intercept	0.369	-0.766***	0.489	-0.736***
	(0.637)	(0.179)	(0.658)	(0.183)
ln(MV)	-0.223**	-0.010***	-0.222**	-0.129***
	(0.098)	(0.032)	(0.105)	(0.033)
R&D_S	-0.710**		-0.771**	
	(0.326)		(0.335)	
ILLIQ	9.175	-0.768	3.514	-0.853
	(6.342)	(0.944)	(6.266)	(1.014)
Turnover	-0.069	0.024	-0.076	0.027
	(0.068)	(0.025)	(0.067)	(0.025)
CAPEX_S	5.258***	-0.001	5.763***	-0.001
	(1.631)	(0.003)	(1.693)	(0.004)
Dividend	-0.159	0.236**	-0.143	0.271**
	(0.397)	(0.115)	(0.427)	(0.119)
KZ_I	0.003		0.004	
	(0.003)		(0.003)	
Acquisitions (IPO)	0.081	0.007		
	(0.181)	(0.067)		
Leverage	-1.491	-0.455	-2.519*	-0.820**
	(1.043)	(0.299)	(1.332)	(0.337)
FCF_A	0.712	-0.138	0.797	-0.171
	(1.07)	(0.215)	(1.008)	(0.218)
Cash_A	0.548	-0.296	0.619	-0.308
	(1.453)	(0.378)	(1.485)	(0.384)
NFA_A	-1.337	0.943***	-2.357	0.993***
	(1.207)	(0.252)	(1.441)	(0.263)
Acquisitions (IPO + 1)			0.258*	0.160***
			(0.150)	(0.053)
Obs	255	1,886	250	1,854
Pseudo R-Square	0.135	0.015	0.157	0.023
LR Chi-Square	37.42***	32.80***	41.36***	47.11***

Appendix 5

Variables Description

Appendix 5 displays this study's variables description, the scale in which they are considered and the database they were retrieved from.

Variable Name	Description	Scale	Database
Abnormal Returns	Difference between the annual accumulated return of stock *i* and the accumulated return of the Euro Stoxx 50 index. Data available since 1987.	Units	DataStream
Acquisitions	Number of M&A transactions, in which the firm was an acquirer, excluding divestitures.	Units	SDC
Assets	Book value of company assets in a given fiscal year.	1,000 million euros	DataStream
CAPEX_S	Ratio of capital expenditures to sales.	Units	DataStream
Cash_A	Ratio of cash and short-term investments to book value of assets.	Units	DataStream
Dividend Dummy	Equals 1 if the company paid cash dividends in a given fiscal year and 0 otherwise.	Units	DataStream
EA Bank Loans to Businesses	Ratio of new business loans to non-financial corporations to GDP in the Euro Area. Data available since 2003.	Units	European Central Bank website
ES Int. Rate on Business Loans	Cost of borrowing for corporations in the Euro Area. Data available since 2003.	Percentage	European Central Bank website
ESI	European Union economic sentiment indicator. Data available since 1985.	Units	European Commission website
FCF_A	Ratio of free cash flow to book value of assets, as computed in Bharath & Dittmar (2010).	Units	DataStream
ILLIQ	Illiquidity measure as computed in Amihud (2002).	Units	DataStream
KZ_I	KZ index as described by Lamont, Polk and Saa-Requejo (2001).	Units	DataStream
Leverage	Ratio of long-term debt to total liabilities and shareholders equity.	Units	DataStream
Market Value	Annual average of the product of the daily closing price and the number of shares outstanding.	1,000 million euros	DataStream
MB	Ratio of market to book value of assets.	Units	DataStream
NFA_A	Ratio of property, plant and equipment to book value of assets.	Units	DataStream

Number of Bond Issues	Yearly number of corporate bond issues by European companies. Data available since 1976.	Units	SDC
Number of IPOs	Yearly number of initial public offerings of European firms. Data available since 1972.	Units	SDC
Number of SEOs	Yearly number of seasoned equity offering issues by European firms. Data available since 1986.	Units	SDC
PE Investment Amount	Private equity and venture capital investment amounts in Europe. Data available since 1988.	1,000 million euros	Investing in Europe: Private Equity activity 2019 and Maula (2012)
R&D_S	Ratio of research and development expenditures to sales.	Units	DataStream
Sales	Company net sales in a given fiscal year.	1,000 million euros	DataStream
Turnover	Annual average of the daily ratio of the number of traded shares and the number of shares outstanding.	Units	DataStream

Appendix 6

Country Groups for the Subsample Analysis

Appendix 6 displays the constituents of the four country groups considered in the subsample analysis, whose results are displayed in subsection 7.3.

Description	Constituents	Nb.
Group 1		**1,561**
	Guernsey	1
	Iceland	15
	Ireland Republic	48
	Isle of Man	2
	United Kingdom	1,495
Group 2		**2,614**
	Austria	57
	Belgium	108
	Czech Republic	15
	France	846
	Germany	611
	Greece	157
	Italy	320
	Liechtenstein	1
	Luxembourg	11
	Monaco	1
	Netherlands	114
	Portugal	50
	Slovak Republic	36
	Spain	131
	Switzerland	156
Group 3		**1,799**
	Bulgaria	146
	Croatia	93
	Cyprus	42
	Hungary	28
	Poland	631
	Romania	138
	Russian Federation	290
	Serbia	96
	Slovenia	24
	Turkey	272
	Ukraine	39
Group 4		**1,442**
	Denmark	137
	Estonia	14
	Finland	151
	Latvia	20
	Lithuania	27
	Norway	281
	Sweden	812